

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1227. (Vol. XXIV. No. 27.)

JULY 1, 1932

Weekly, Price 6d.
[Post Free, 7½d. Abroad, 8d.]

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: (2 lines), Holborn 3211 and 1884.

Telegrams: Truditur, Westcent, London.

Annual Subscription Rates, Post Free.

United Kingdom .. 33s. 0d. United States .. \$8.75.

Other Countries .. 35s. 0d.

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- July 2. Arrival of Graf Zeppelin at Hanworth, 6 p.m. approx.
- July 2. Opening of Portsmouth Municipal Aerodrome.
- July 2-3. International Tourist Rally, Rheims.
- July 3. Meeting at Cote Hill Aerodrome, Rugby.
- July 5-7. R.A.F. Athletic Championships at Uxbridge.
- July 8-9. King's Cup Air Race, start and finish Brooklands.
- July 9. R.A.F. Athletic Championships at Uxbridge.
- July 9-10. International Tourist Rally and Meeting, Clermont-Ferrand.
- July 14. International Rally, Saint-Brieuc.
- July 16-17. International Meeting, Dieppe.
- July 21. General Meeting of R.N.F.C. in the R.U.S.I., 5.30 p.m.
- July 22-31. International Meeting, Zurich.
- July 23-24. York County Aviation Club "At Home," Sherburn-in-Elmet.
- July 30-31. Skegness Air Pageant.
- Aug. 1. Cowes Air Pageant.
- Aug. 6. Newcastle Air Meeting, Cramlington.
- Aug. 6. London-Newcastle Air Race.
- Aug. 11-28. International Touring Competition, Berlin.
- Aug. 15-16. Cricket : R.N. v. R.A.F. at Lords.
- Aug. 19-21. 4th Annual Canadian Air Pageant, St. Hubert, Quebec.
- Aug. 20. Ryde Air Pageant.
- Sept. 3. Leicester Chamber of Commerce Day, at Desford.
- Sept. 4. Divine Service at Ratcliffe Aerodrome, 2.30 p.m.
- Sept. 5. F.A.I. Conference at The Hague.
- Sept. 8. International Meeting, Vicenza, Italy.
- Sept. 24. Air Display at Hillmans' Aerodrome, Gallows Corner, Brentwood.
- Sept. 25. Gordon Bennett Balloon Race, Basle.
- Oct. 1. Bristol and Wessex Ae.C. Garden Party.
- Oct. 18. Aero Golfing Society : Cillon Challenge Cup, West Hill G.C.
- Nov. 18-Dec. 4. Paris Aero Show.

EDITORIAL COMMENT



THE persistent re-equipment work of the last twelve months bore fruit at the Royal Air Force Display on Saturday last. The great crowd which assembled at Hendon saw practically no obsolete or obsolescent aircraft in the air. Perhaps the ordinary spectator hardly realised the difference, and was unaware of the special quality of the machines which performed before his eyes this year. The dives and zooms of the "Furies" may have seemed to such an one no more sensational than the dives and zooms of the "Gamecocks" of a few years ago. Sgt. Methven did wonderful things with the "Sideshow" when the "Bulldogs" attacked it; but some with long memories may have thought that there was not much advance on the performance of a "Bugle" once flown by Sqd. Ldr. Longton in a similar air combat. In fact, one has to preach hard (and the official programme does preach very hard and very persuasively) to make the ordinary spectator realise the significance of what he is seeing, and to appreciate the advance made year by year by the Royal Air Force.

What we must not forget is that large numbers of foreign experts come to Hendon every year to watch the Display. Among them there is no one whom we are more glad to welcome than Gen. Italo Balbo, and in all probability no visitor has a more knowledgeable and more critical eye. It would be unfitting if the representatives of our sporting rivals in so many Schneider Contests were to see the Royal Air Force driving a lot of antediluvian crocks through the air. Italy, naturally, is not likely to buy British aircraft, though "Jupiter" engines are built there. Other nations, however, send their representatives to this country with the deliberate intention of deciding if British aircraft will best suit the needs of their own country, or if they should look elsewhere. Even that great aeronautical nation, France, builds great quantities of "Jupiter" engines under licence, and flies some "Calcutta" flying-boats with great satisfaction. Belgium,

equipped with "Fireflies" and "Foxes," can put up a performance in the air out of all proportion to the size of her flying corps. Many other nations have bought large quantities of British aircraft, and we want to persuade them to repeat their orders, and to get other countries to follow their good example. The foreign spectators, we may feel sure, are usually keenly alive to the performance of the machines which they see at the Hendon Display, and it is a very important matter that they should be favourably impressed.

There is another consideration. The wise old Romans had a maxim, which it is very unfashionable to quote just now. They said *Si vis pacem, para bellum* (if you desire peace, prepare for war), and historians can quote instances of aggravated nations which would dearly have liked to go to war, but were restrained by a consideration of the superior strength of their prospective opponents. We are sometimes told nowadays that to prepare to defend oneself is to invite a race in armaments. That, perhaps, may apply to what is now called quantitative armament. If a country raises what appear to be unduly large forces, a feeling of uneasiness about that country's intentions may well be aroused. Qualitative armament, which means having all arms the best of their kind, whatever the numbers, is not likely to arouse such suspicions, but it does create respect for the nations which obviously have no aggressive intentions but which equally obviously mean to make things very unpleasant for anyone who attacks them.

No one can say that our Royal Air Force is bloated in numbers. A good many years ago we decided that 52 squadrons should be the minimum number devoted to the Air Defence of Great Britain. We are still a long way short of that minimum, and so no doubts can possibly be raised as to our pacific intentions. But it is most important, not only for ourselves but for the peace of the world, that everyone should know that Great Britain is not helpless in the air, and does not lie an easy prey for any nation which chooses to attack her. If our Air Force is small, its quality must be of the best. Our pilots always have been of the best, but in all years we have not been able to boast that our aircraft in general has been worthy of the pilots. There have been years when re-equipment has lagged behind our needs, and in consequence our reputation must have suffered in the eyes of foreign visitors to the Display. It is not good policy to let them see the majority of our squadrons equipped with types of aircraft which they know well are out of date. Such a Display does not create the respect for Great Britain which we consider that all our friends and our un-friends (if any) ought to entertain. Our friends ought to feel that we should make a worthy ally. People who have no love for us ought to be made to realise that those who would tackle the little British Air Force would be putting their hands into a hornet's nest. The impression which we create must depend in no small measure on the types of machines which take the air at the R.A.F. Display.

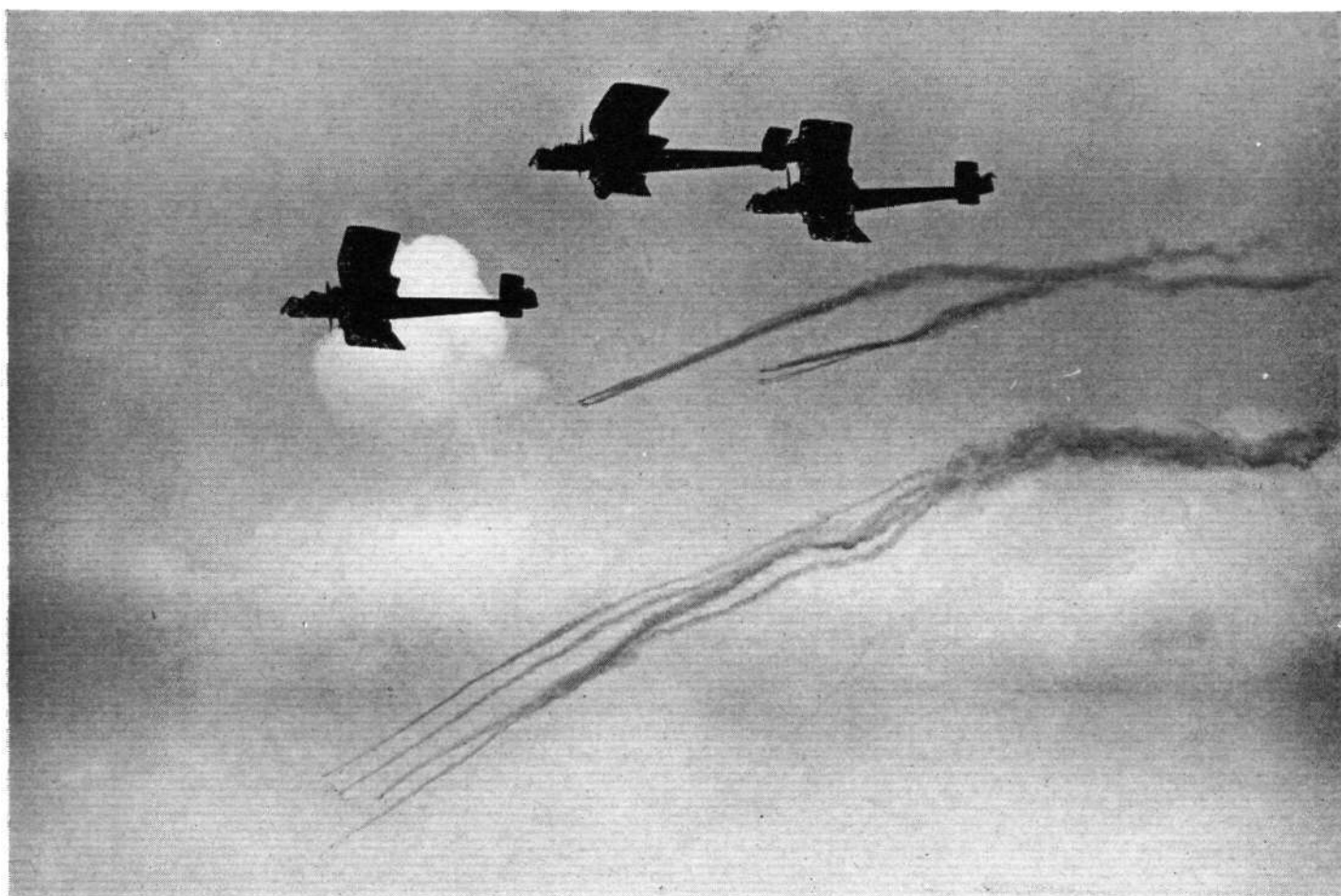
There have been years when we have felt that too many squadrons were flying types of aircraft which had outlived their utility. In those years the number of squadrons was even smaller than it is now, and perhaps it was the wisest policy to spend what money was available on increasing quantity rather than

improving quality. The international situation of late has caused us to alter our tactics, and during the last year we decided to authorise the raising of no new squadrons, but to concentrate our energies on giving the existing formations the very latest type of aircraft. The result of this policy made the outstanding feature of this year's Display. There was nothing particularly novel in the form which the items of the programme took. Aerobatics, air combat, army co-operation, air racing, bombing, amusing turns, set piece, were all much as before. What made the difference was that practically all the events were carried out by up-to-date types. We saw no "Grebes" sky-writing, no Bristol Fighters, no D.H.9A's. "Harts," "Furies," "Bulldogs," "Wapitis," and other machines of the first class bore the brunt of the work. Admittedly the Royal Air Force has had no new type of night bomber for a long time; but at least we do not pretend that we are satisfied with the present position. We intend to alter it as soon as may be.

One pleasant result of the general use of new types of aircraft was that the events were carried through at a much greater speed than in past years. Three squadrons of "Harts" drilled together as a Wing, changing formation many times and covering many miles during each change. With some of the old type bombers in past years this would have meant a very weary wait between each appearance of the Wing over the aerodrome. On Saturday the delay was quite inconsiderable. A squadron of "Furies" was given just 15 minutes in which to show off their air drill, and in no event was the time limit exceeded. During that short time the squadrons crossed the aerodrome 10 times, each time in a different formation. For sheer smartness this could hardly have been beaten.

Finally we must not forget the effect on possible foreign purchasers of seeing new types in plenty. Our aircraft exports have now reached an annual value which must seem far from contemptible to the Chancellor of the Exchequer. We have every reason for wanting to see the bulk of foreign orders increased. It would not only help to set the balance of trade right, but also assist to keep our aircraft firms at work in days when orders from the Air Ministry are not so lavish as the firms would naturally like to see them. Thus the foreigner helps to pay for the maintenance of an industry which is of vital importance to our national security. The R.A.F. Display has a special value as a showroom for British goods. Its main drawback in this respect is that too little opportunity is given for examination of the machines.

To remedy this, the Society of British Aircraft Constructors conceived the very happy idea of writing a sequel to the Display by inviting all the foreign experts now in London and many others to an intimate inspection of British aircraft at Hendon on the Monday following the Display. Most of the types which took part in the Display could be examined and studied at leisure on the ground and in the air; and other types were also on view, as well as great numbers of accessories. The function was excellently organised, and the fine weather held. If any potential purchaser is not now completely assured that British aircraft would be the best investment for his particular country, the fault must be his own; and it is a fault for which his country will have to suffer in the long run.



LOW BOMBING : Three Vickers "Virginias" ("Lions") of No. 9 (Bomber) Squadron dropping smoke bombs on a ground target. (FLIGHT Photo.)

THE THIRTEENTH R.A.F. DISPLAY

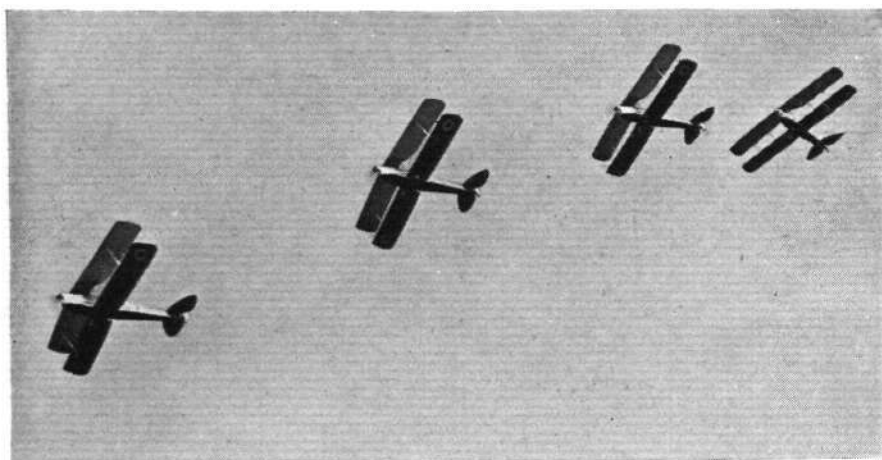
THERE were pessimists who murmured "13." There were Jeremiahs who foretold rain. There were cynics who said that the Display was getting stale. There was (we were told, though we saw nothing of them) a Peace Army which tried to do something—we are not certain what. All the ravens were gloriously confounded. The Thirteenth Royal Air Force Display was once more a brilliant success, and if anything was just a trifle better than some previous Displays.

The weather was a curious mixture. There was a good deal of sun mixed with a fair amount of cloud. A fresh and rather bumpy breeze was blowing, but at the same time the air was a trifle oppressive and stuffy. No rain fell, and on the whole there was little cause for complaint. Royalty was present in the person of Air Vice-Marshal H.R.H. the Duke of York. An enormous crowd testified to the continued popularity of the Display. The flying and the organisation were magnificent. There was nothing to detract from the pure enjoyment of a glorious holiday in the open air.



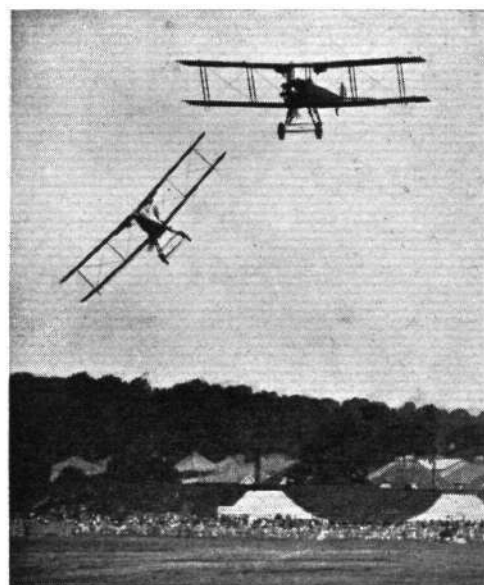
DROPPING SUPPLIES : Three Armstrong-Whitworth "Atlas" ("Jaguar") of No. 16 (Army Co-operation) Squadron. (FLIGHT Photo.)

The organisation of the Royal Air Force at the Display is almost uncannily efficient. Never before has it been so completely demonstrated. There was no lag anywhere. There was once a time when it was a common saying that aeroplanes were never in time for anything except at the R.A.F. Display. Luckily, those days are past, and the virtue of punctuality has been recognised and is usually practised by all, from Imperial Airways downwards, who have anything to do with the organisation of flying. Still, however, the R.A.F. takes the palm by bringing each



LINING UP FOR THE TORTOISE RACE: Four "Tiger Moths" getting ready for the slow-flying race. On the right, the instructor just avoids collision with his clumsy pupil in the demonstration of instructional flying on Avro-Lynx.

(FLIGHT Photo.)



formation over the aerodrome just at the right split second. It must take quite a lot of rehearsing, and the result could not be better.

As for rehearsing, those who saw the exhibition at Andover eight days before will realise how hard the squadrons must have rehearsed in the last few days. The Andover Display was very good, and no holes could be picked in it except by hyper-criticism. The R.A.F. has invited hyper-criticism; in fact, it has demanded it, and made it inevitable by the extraordinarily high standard which has been set by the best items in the previous Displays. Judged by that very high standard, one felt at Andover that here and there some slight improvement was possible. In some formations a machine or a flight might have been a yard or two

out of place. How it is possible for formation leaders to judge position to within a yard or two when moving at such speed we do not profess to understand. We only know that in the best events in the best years such perfection has been attained, and we have come to watch the formation flying with something like the eye of a drill sergeant of the Guards. At Andover we noticed just one or two incorrect intervals and distances. At Hendon all that had been put right, showing what good use had been made of the last few days of practice.

THE WORLD AND HIS WIFE: A panoramic view of Hendon Aerodrome during last Saturday's Display.

(FLIGHT Photo.)





THE DAY BOMBERS : Nos. 18, 57 and 33 Squadrons (Kestrel-Hart) getting ready for their take-off. The Auxiliary Wing is just behind them (Jupiter-Wapiti).
(FLIGHT Photo.)

Preliminary Events—The Headquarters Race.

The opening event of the Royal Air Force Display was, as is customary, the Headquarters Race.

This race is a handicap one of about 28 miles, for a Cup presented by Air Vice-Marshal His Royal Highness the Duke of York, and is open to one Officer from the Air Ministry and one from each Command Headquarters in England.

The course lay around a circuit of roughly 14 miles in length, and this was so arranged that the aircraft were in sight throughout the whole race, while the start and finish of both circuits lay across the aerodrome, parallel to the main enclosure, thus giving people an excellent view of the progress of the machines. When they came round for the first time they had not bunched up very much except for the "Siskins," which had closed together and had all overhauled the "Wapiti." This latter appeared to deviate from the course followed by the other aircraft in the race when on the north side of the aerodrome. Coming in for the finish, the order had changed considerably, and the final result was: (1) Sqd. Ldr. Collier, on a "Hart"; (2) Flt. Lt. Adams, on a "Siskin"; (3) Flt. Lt. Bonham-Carter, on a "Hart." The starters were:—

Headquarters Represented	Pilot	Aircraft	Engine.
Air Ministry	Flt. Lt. D. MacFadyen	"Bulldog"	"Jupiter."
Air Defence of Great Britain ..	Sqd. Ldr. A. C. Collier	"Hart"	"Kestrel."
Wessex Bombing Area	Flt. Lt. D. W. F. Bonham-Carter ..	"Hart"	"Kestrel."
Fighting Area	F/O. E. H. Bellairs	"Fury"	"Kestrel."
Inland Area	Air Comm. J. B. Bowen, O.B.E. ..	"Siskin"	"Jaguar."
Coastal Area	Flt. Lt. M. V. Ward	"Nimrod"	"Kestrel."
No. 1 Air Defence Group	Flt. Lt. H. J. Saker	"Wapiti"	"Jupiter."
Cranwell	Sqd. Ldr. P. G. Scott	"Siskin"	"Jaguar."
Halton	Flt. Lt. C. D. Adams	"Siskin"	"Jaguar."



THE NEW PTERROR : The Westland Pterodactyl (Gipsy) appeared in new colours for the purpose of monster-chasing.
(FLIGHT Photo.)





HOME AGAIN: The "Wapitis" of the three London A.A.F. Squadrons returning after their display. (FLIGHT Photo.)

Air Co-operation with Ground Forces

The work of Army co-operation aircraft offers plenty of scope for an interesting display, and that arranged for this year was typical of the varied duties which the Army Co-operation and Bomber-Transport Squadrons have to undertake. The event was divided into four phases, each dealing with different and distinct duties.

The scene was laid in the desert (represented by the grass of Hendon Aerodrome!), and, to quote the words of the well-produced programme:—

"A small Desert Mechanical Transport Column is sent out to guard certain wells, which a desert raiding party is expecting to use. On arrival, the Officer commanding the Desert Column reports by wireless to Headquarters that information from friendly natives, which is believed to be reliable, leads him to expect that he will be attacked in force. He therefore asks for reinforcements, and states that within twelve hours he can clear sufficient ground of boulders and scrub to permit aircraft with reinforcements to land.

"Meanwhile supplies are dropped for the column by six 'Atlas' aircraft ('Jaguar' engines), and the same aircraft pick up dispatches. Later, Bomber-Transport aircraft, Vickers 'Victorias' (Napier 'Lion' engines), land and deplane a reinforcement of airmen with machine guns and mortars. To impress the friendly local chiefs, the whole Force gives a demonstration of fire power. Sick airmen are taken on board the Bomber-Transports and the aircraft depart for their base."

Phase I was the dropping of the supplies by the "Atlases," of which there were two flights, each of three aircraft from No. 16 (Army Co-operation) Squadron, commanded by Sqd. Ldr. A. R. Churchman, D.F.C.

The two flights each passed over the "Desert Column" twice and dropped their supplies. These supplies are packed in special containers and are attached to small parachutes, which open automatically when released. The "Desert Column" consisted of four motor-lorries with their crews, and these men, dressed for the part, rushed out and secured the supplies as they came down.

Phase II was the message picking up and dropping part of the display. Here again the "Atlases" took part. They first of all flew across in line astern with their picking-up hooks lowered, and secured their messages from the lines erected by the men on the ground. After having picked-up in line astern, the two flights flew across one after the other in Vee formation and picked up further messages while still in formation, and finally they repeated this, but both flights flew in together and gathered their messages from lines raised either side of the lorries. Answers to these messages were then thrown down from the aircraft, as it was assumed that the ground force had no wireless equipment. These messages were in small bags with streamers attached and were dropped when the aircraft flew low over the objective.

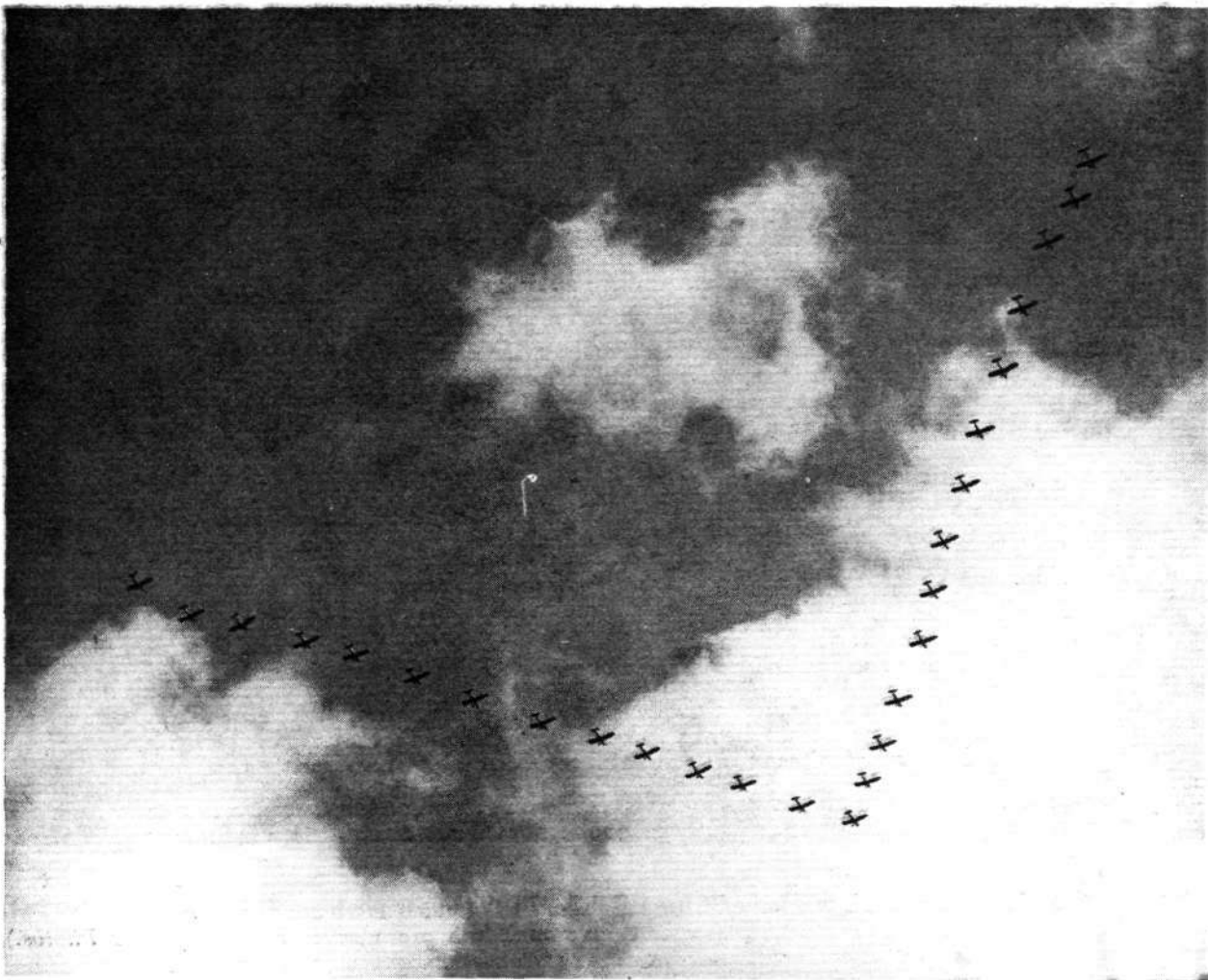
Duties like these would normally be carried out by only one aircraft, but for the purposes of the Display, doing them in formation makes it all appear more attractive as a spectacle.

By this time we may assume that the boulders had



AIR DRILL: Two of the "Hart" Squadrons during their evolutions. (FLIGHT Photo.)

all been removed as the "Atlases" came in and landed. A booming noise then heralded the arrival of three Vickers "Victorias" (Napier "Lions"), a type of aircraft which was used to evacuate the Europeans from Kabul in 1929 and also for transporting troops to places where disturbances have broken out in Egypt and the East on many occasions. Mortars and machine-guns were unloaded from the "Victorias" in double-quick time, and in a very few minutes the "demonstration of fire-power" was in full



"WING VEE": Twenty-seven "Harts" beginning their demonstration of air drill.

(FLIGHT Photo.)

swing. After several rounds had been fired from the mortars a number of supposedly sick airmen were taken on board the Bomber-Transports, which then took off to fly back home again. This evolution was carried out in the middle of the aerodrome, but nevertheless it was quite possible for the spectators to see what was happening.

Bombing Demonstration

Looking back on previous Displays, when one's heart pulsations and eye muscles were considerably speeded up by the ding-dong dashes of several fast and comparatively small machines during the demonstrations of converging bombing, this year's bombing demonstration was, in comparison, quite an "arm-chair" affair. We could sit back lazily and observe the "slow-motion" bombing of the three "Virginias" without any undue energy—mental or optical. It was none the less interesting, however, for all that.

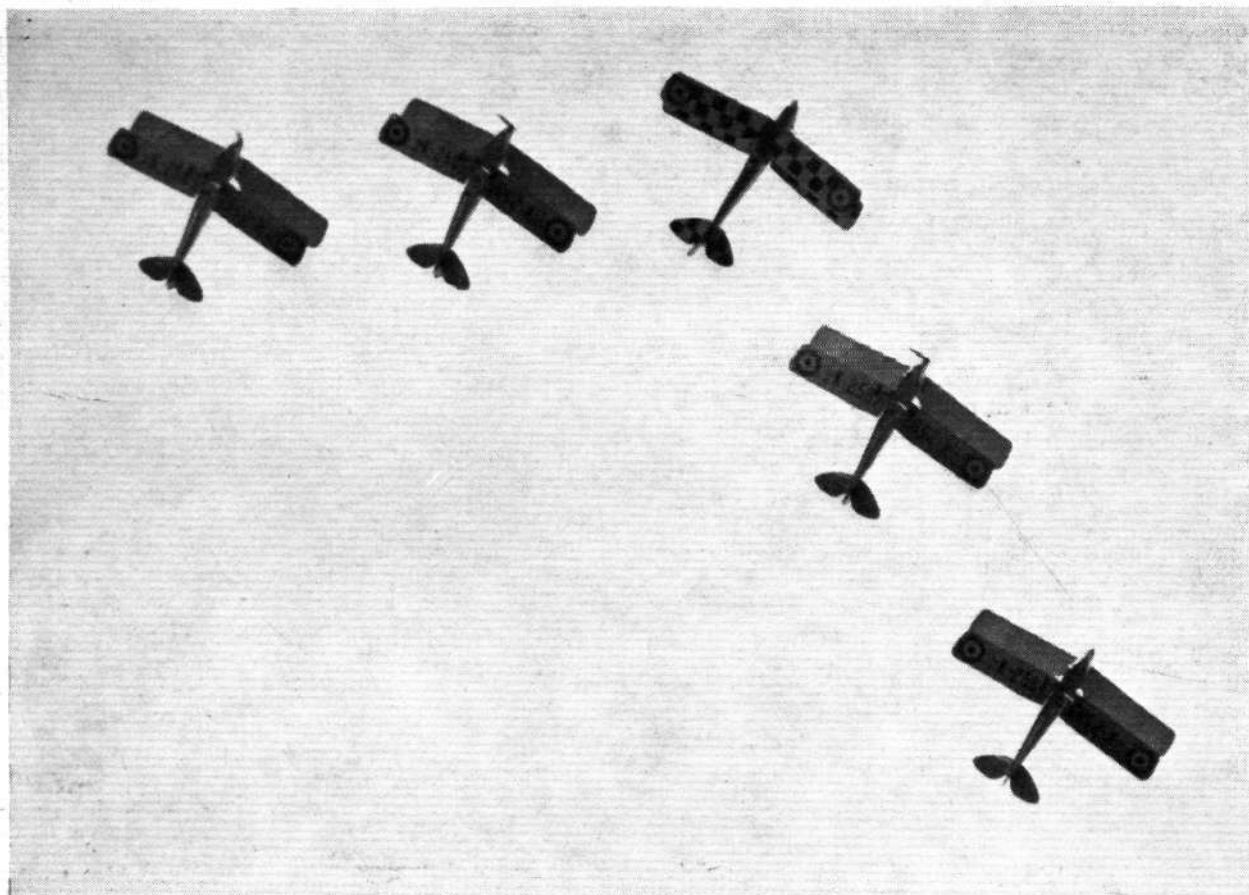
This demonstration was carried out by three Vickers "Virginias" (Napier "Lions") from No. 9 (Bomber) Squadron, under Wing Com. F. W. Stent, M.C., using practice bombs dropped from a low altitude on a target marked out by canvas strips and flags in the centre of the aerodrome. After taking off in formation and making a preliminary flight over the target, the three bombers then came up-wind in line astern, releasing their bombs in succession, one salvo falling direct on the mark.

They then came over the target across-wind—towards the southern enclosures—the first salvo striking a trifle previous, the second being a direct hit, and the third to leeward. Next they came along up-wind again, and this time all bombs hit the mark. Finally the "Virginias" flew over the target in formation,

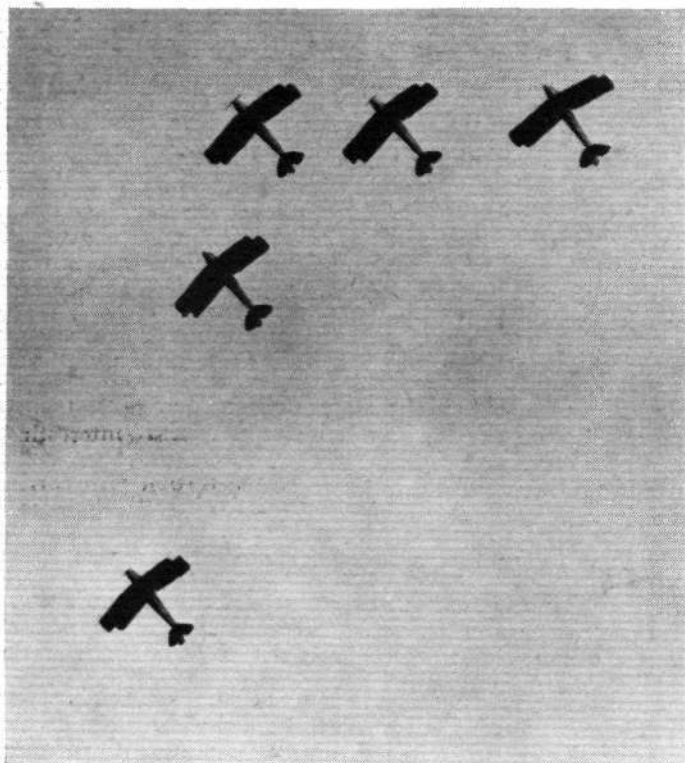


MORE AIR DRILL: Another formation by the "Hart" Wing.

(FLIGHT Photo.)



INVERTED FLYING: "Tiger Moths" from C.F.S. In the upper photograph the leader is inverted and the others "right way up." Below, all five machines are upside down. (FLIGHT Photos.)



up-wind, and again all bombs were neatly placed on the mark.

The Tortoise Race

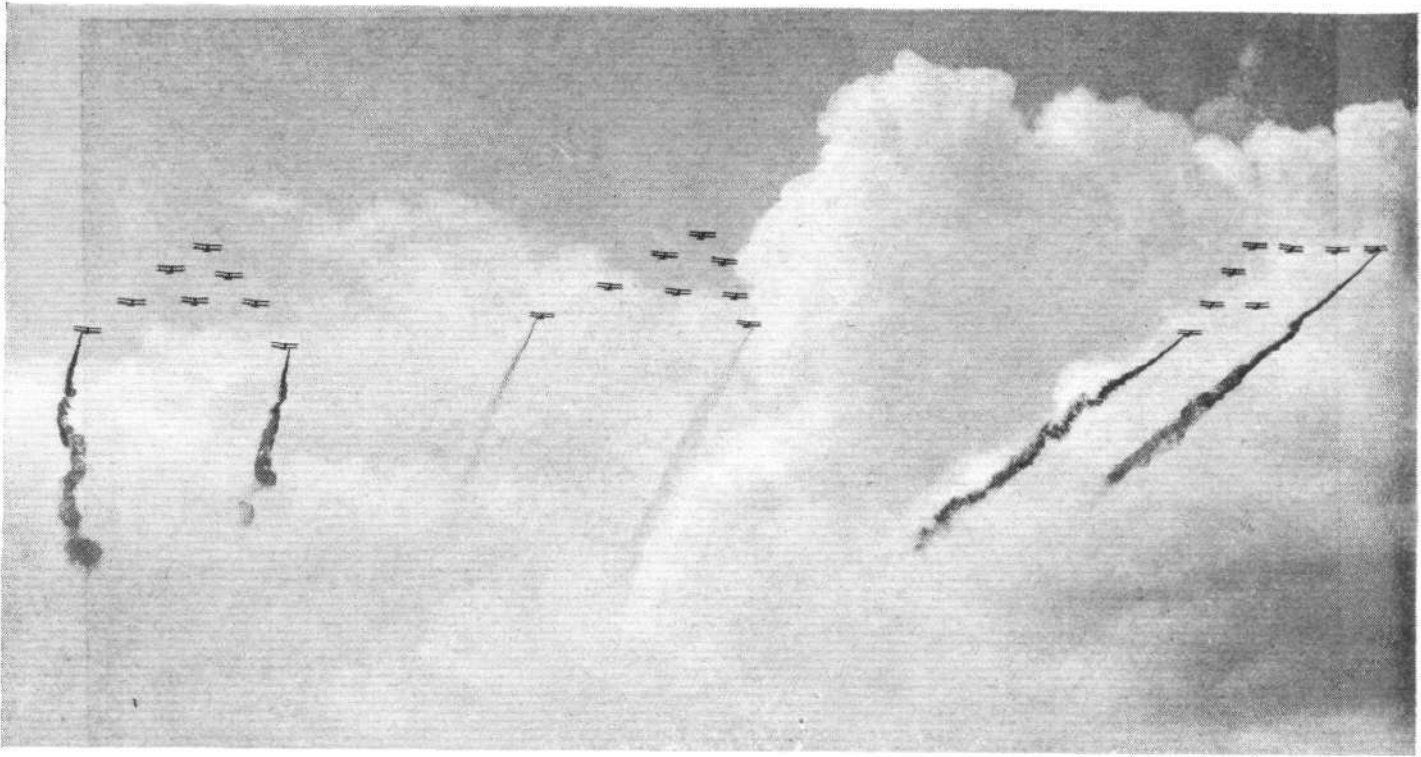
The next event was a demonstration of slow flying, in the form of a "fly the slowest race," in which the following pilots, Flt. Lt. L. R. Stokes, F/O. D. D. Christie, F/O. V. R. Moon, and Pilot Serg. S. J. Mansell, in D.H. "Tiger Moths" ("Gipsy" engines), endeavoured to fly at the slowest speed at which the aircraft would not lose height.

First the four "Tiger Moths" flew past at normal

speed in line astern, then they flew over the aerodrome across-wind in line abreast, each pilot checking his speed by a series of stalls. At first the third machine rapidly "underhauled" his rivals, but lost altitude in his effort. Finally No. 3 machine fell behind in fine style with only a comparatively small loss in altitude. It was quite an interesting event, which certainly "tortoisised" a lot regarding the advance made in present-day flying with the help of automatic slots, etc.

Air Combat—"Hart" v. "Furies"

Somewhat arbitrarily the programme is divided into Preliminary Events and Main Events, and it usually happens that each section includes an air combat. One expects the first one to be good and the second one to be better. This year, however, the air combat at 2.02 p.m. was the most sensational sham fight ever seen at Hendon. Few, if any, people have ever before seen three "Furies" attack a "Hart." This combat was fought at a speed which was quite unprecedented, and deserved the much abused epithet of "thrilling." Incidentally both the programme and the loud speakers deliberately attempted to mislead people by describing the "Hart" as a "day bomber," though the programme itself gave the case away in a subsequent line by admitting that the "Hart" came from No. 23 (Fighter) Squadron. It was, in fact, a two-seater fighter, unhampered by all the gear which are necessary to an efficient bomber. It was flown by Flt. Lt. W. L. Bateman. We pay no attention to the casualties represented by streaming smoke and wing tip flares (the smoke used, by the way, was blue, hitherto believed to be a colour for which Major Savage's chemists had striven in vain), and so we do not waste time wondering why one surviving "Fury" was able to shoot down the "Hart" after the combined efforts of three had resulted in giving two victories to the rear gunner in the two-seater. It seemed that even then the "Hart" should not have fallen had it not been so imprudent as to fly straight for a while with the last "Fury" under its tail. So long as the "Hart" kept manoeuvring, it was obviously very hard for the single-seaters to get their sights on to it. Anyway, the fight made a grand show. The "Furies" belonged to No. 25 F.S. and were flown by Flt. Lt. C. R. Hancock, F/O. K. B. B. Cross, and F/O. F. P. R. Dunworth.



"A.A.F." : Spelled by the Auxiliary Air Force Wing.
(FLIGHT Photo.)

Instructional Flying

An amusing variation of the time-honoured crazy flying was thought out this year. Two instructors from No. 2 Flying Training School at Digby, F/O's E. S. Greenwood and P. R. May, played the parts of flying pupil and flying instructor. The latter would perform a manoeuvre correctly in his silver Lynx Avro, and then the pupil in a red Avro would attempt to copy it. The red machine showed what would happen to a pilot who tried the manoeuvre without knowing how to carry it through. An attempted vertical bank brought it out facing the wrong way, with an obvious look of surprise on the propeller boss of the Avro. Then the pupil stuck on the top of a loop, and went down in a spin. Finally, whenever the instructor tried to land, the pupil would fly across and baulk him, and collisions were escaped by an apparent hair's breadth. The loud speaker was in very happy vein in describing the happenings, and the crowd showed itself quite able to appreciate the finer points. It roared with laughter at the mistakes of the red Avro, and applauded both pilots when they ultimately got safely to earth. It was an excellent bit of fooling.

Monsters of the Air

Pupil and Instructor having been got out of the way in safety, more trouble turned up in the way of an invasion of hitherto unknown monsters of man-eating propensities from Mars. These monsters—some of which, if we remember rightly, tried to gate-crash during the last Display—could only be destroyed, we were told, by shooting them down whilst in the air from aircraft themselves camouflaged as monstrosities.

The aircraft used for this dirty work were described as a Terror Mark I (Terrific Mark I engine) and a Terror Mark II (Terrific Mark II engine). As regards the first, which was piloted by F/O. M. Watson, we gave a Harty laugh when we saw through its disguise—but when we saw the second, which was piloted by Flt. Lt. G. H. Stainforth, A.F.C., we were truly amazed. Had we been asked, before this event, if it would be possible to camouflage a Westland "Pterodactyl IV" ("Gipsy" engine) so as to look like an unknown monster, we would have answered—"impossible and unnecessary." Yet, this was what the Directorate of Unscientific Bismirch—or whoever was responsible for the camouflage—had succeeded in doing. It was, in fact, a bigger Pterror than ever.

Anyway, the two Terrors were sent off to hunt the monsters from Mars, the first of which, a Porker Snout, suddenly rose into the air, hugging the main enclosure tail first. Stainforth was soon after it, and before you could say "Schneider" the Porker's crackling was crackling. Meanwhile a Red Poof Owl hooted for a change



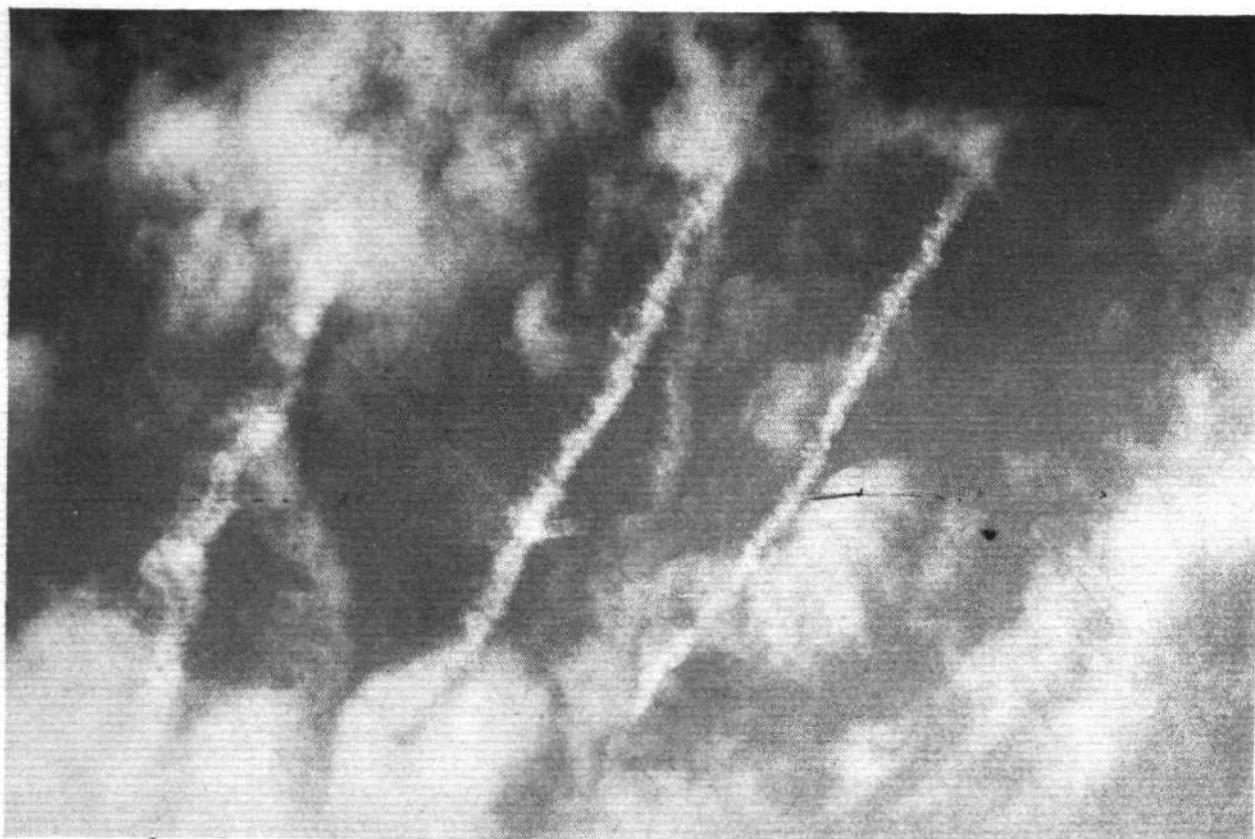
AIR COMBAT : "Sidestrand" v. "Bulldogs."
(FLIGHT Photo.)

of wind and floated over the heads of the spectators towards Golders Green, and looked at first like getting away, only to meet a little later the same fate which befell the Porker. Various other monsters of weird and wonderful aspect took the air, but the change of wind carried most of these over and into the enclosures, so that with one or two exceptions their fate at the hands of the two Terrors was shrouded in mystery from our point of observation.

However, the Terror Mark I appeared to be pleased with its work, for it Ptore past the enclosures, uttering unearthly noises, and winking one of its monstrous eyes!

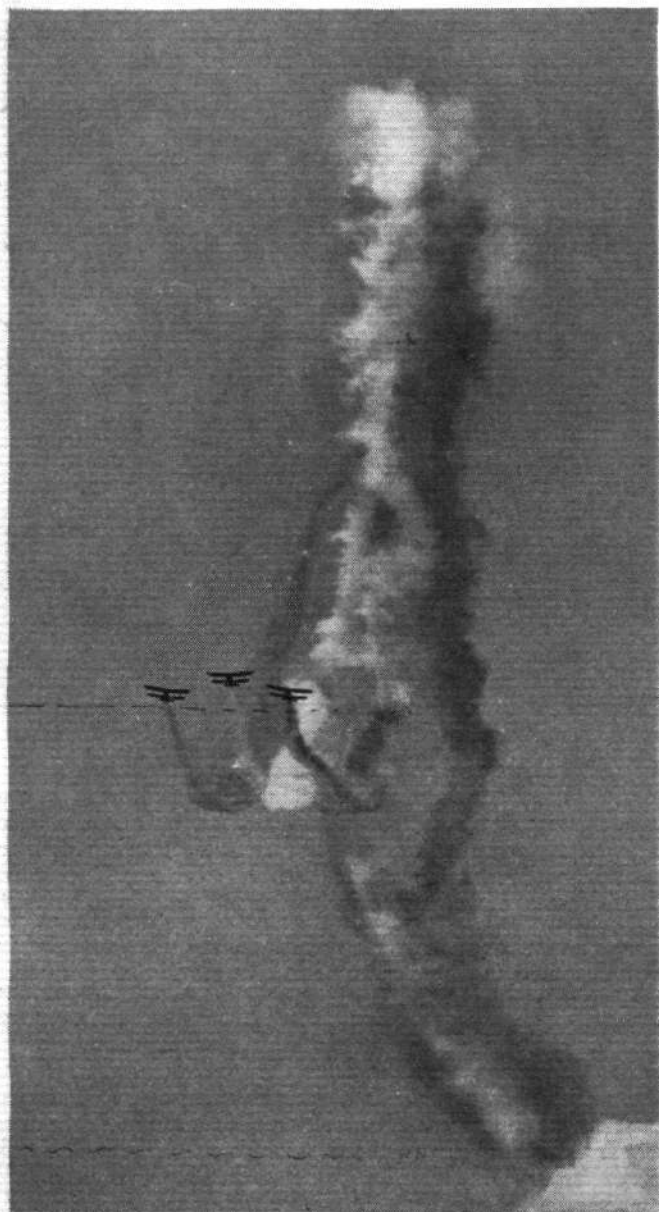
Individual Aerobatics

This was the final of a competition between three flights of No. 41 (Fighter) Squadron, each flight being represented by its selected pilot. Those taking part were:—F/O. H. Broadhurst, P/O. F. G. L. Smith, Pilot Sgt. A. W. Boucher, and they were all flying Bristol "Bulldogs"



"GENTLEMEN, YOU MAY SMOKE" : Martlesham pilots on "Bulldogs" writing the letters "R.A.F." with coloured smoke.

(FLIGHT Photo.)



("Jupiter" engines). They all carried out the same series of manœuvres, which included a preliminary dive followed by a zoom with an upward spin, a half roll and then back the same way, a half roll followed by half a loop, a vertical figure of eight formed by two consecutive loops, with a half roll in the middle, and finally a dive and steep zoom right up to the stalling point where the machine was allowed to fall over and dive down again. Pilot Sgt. Boucher undoubtedly put up the best display, and was announced as the winner. His manœuvres were cleanly performed without any deviation from the direction of flight in which he started and throughout he was very pretty to watch.

Take off by two Bomber Wings

The main events commenced at 3 p.m. with the take off of two complete bomber Wings, each composed of three squadrons. The first Wing was an all-"Hart" Wing, with No. 18 (Bomber) Squadron in the van, No. 33 B.S. to the right rear, and No. 57 B.S. on the left rear. All three went off simultaneously in squadron formation.

The next Wing was made up by three Auxiliary Air Force Squadrons in "Wapitis." It was led by No. 600 (City of London) (Bomber) Squadron, with No. 604 (County of Middlesex) B.S. on the right rear and No. 601 (County of London) B.S. on the left rear. The two Wings flew away and hid in the distance, leaving the stage clear for the next event.

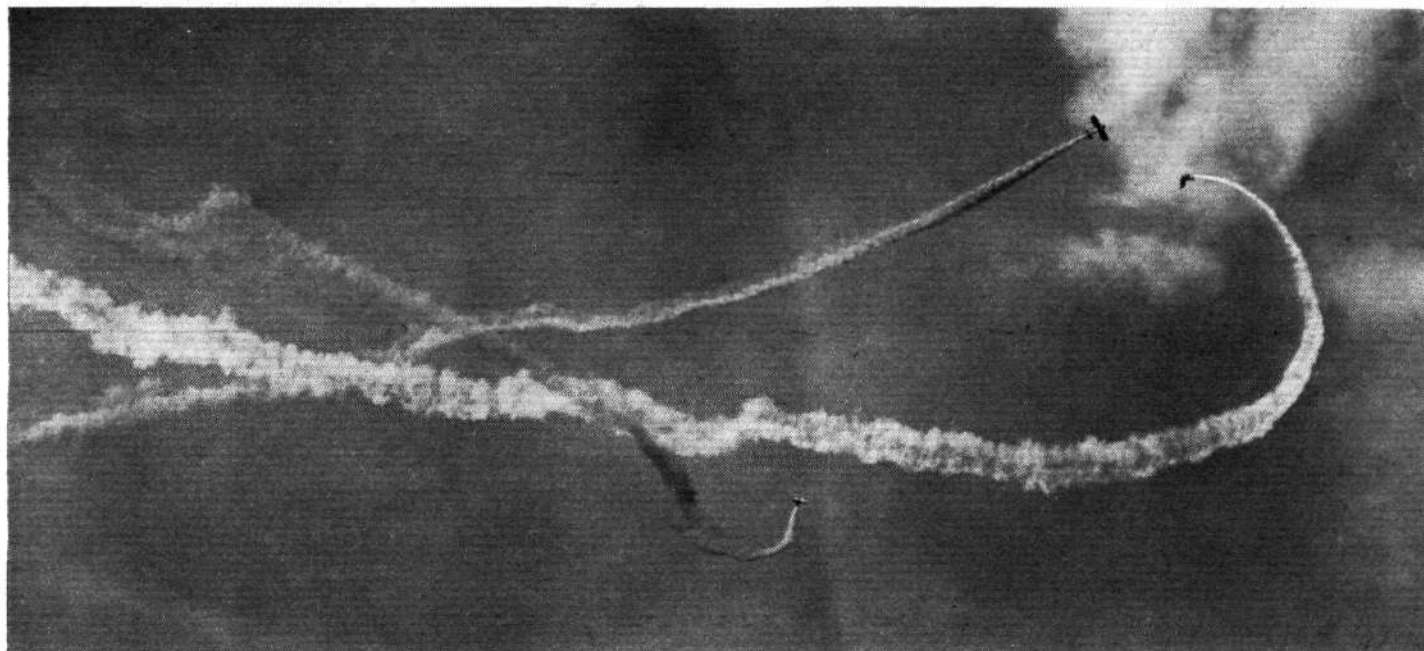
Synchronised Aerobatics

This event was a display of synchronised aerobatics by two pilots of No. 1 (Fighter) Squadron, F/O. J. L. M. Davys and Pilot Sgt. C. Scragg, both flying Hawker "Fury" aircraft (Rolls-Royce Kestrel engines).

In previous years the aircraft used for this event have not had the speed range possessed by the "Fury," and it was therefore very much more difficult for the two pilots to synchronise their manœuvres. This year having "Furies" they were able to do almost exactly as they

STILL SMOKING : The three "Bulldogs" in Formation.

(FLIGHT Photo.)



"WEAVING" : The three "Bulldogs," piloted by Martlesham pilots, intertwining their smoke trails.

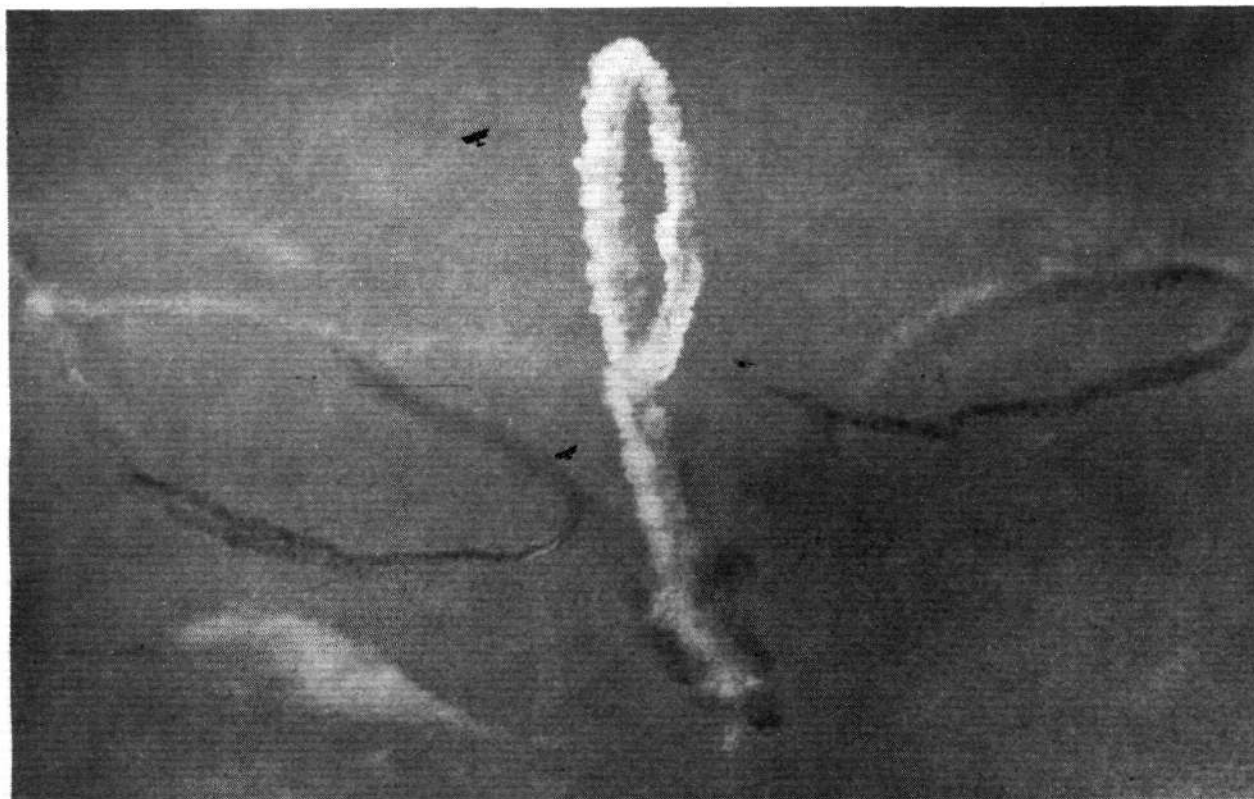
(FLIGHT Photo.)

wished to do, and the result was as near perfect as we are ever likely to see. The general idea was for the two aircraft to approach the aerodrome from different sides and then to cross while doing each manoeuvre right over the centre of the aerodrome. Done in this manner the sight of two aircraft looping close together is almost more impressive than it is when done in formation. At the end of the display the two machines landed side-by-side, and by doing so, very slowly indeed, they showed off the wonderful speed-range of the "Fury" to perfection. Their aerobatics were faultless and perfectly timed throughout.

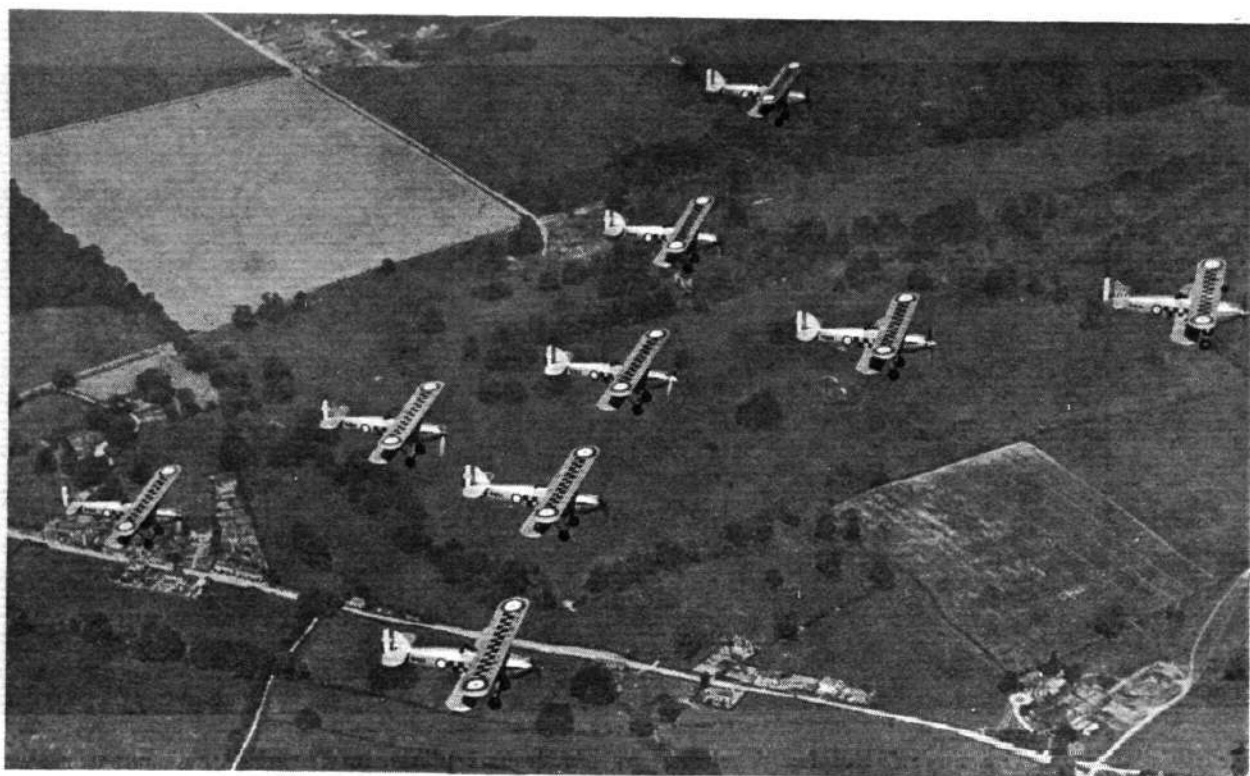
Fly-Past of Auxiliary Wing

There was a time when we, and in fact most people, were surprised to find that the units of the Auxiliary Air Force could fly in good formation. That time is past.

We have come to take their excellence for granted, and scarcely feel impelled to comment on it. If we ever do see a machine of an Auxiliary squadron behaving in an amateurish way, we shall feel quite aggrieved, and shall probably ask in a nasty tone of voice what sort of flying does the fellow think that we taxpayers are spending next to no money for? At the Display we could find nothing to grumble at in the fly-past of the three London squadrons. They took up a novel formation of three letters, A A F, the initials of their force, eight "Wapitis" of each squadron forming one of the letters. Two machines of each letter trailed out smoke, red from one letter, white from another, and blue from the third. The formation was not one which would be used in war, but it showed the high state of training which all the squadrons have reached. Afterwards the three formed up as a Wing and they dived and zoomed in front of the Royal Box.



"ICH DIEN" : "Prince of Wales' Feathers" formed with smoke. (FLIGHT Photo.)



THE SIGN OF THE CROSS: Hawker "Furies" ("Kestrel") of No. 43 (Fighter) Squadron showing one of their ten formations. (FLIGHT Photo.)

Air Combat—"Sidestrand" v. "Bulldogs"

Three "Bulldogs" (Bristol Jupiter engines) of No. 41 (Fighter) Squadron, flown by Flt. Lt. A. Leach, F/O. W. H. Husbands, and Pilot Sgt. B. J. Marsden, in this event went up and attacked a Boulton and Paul

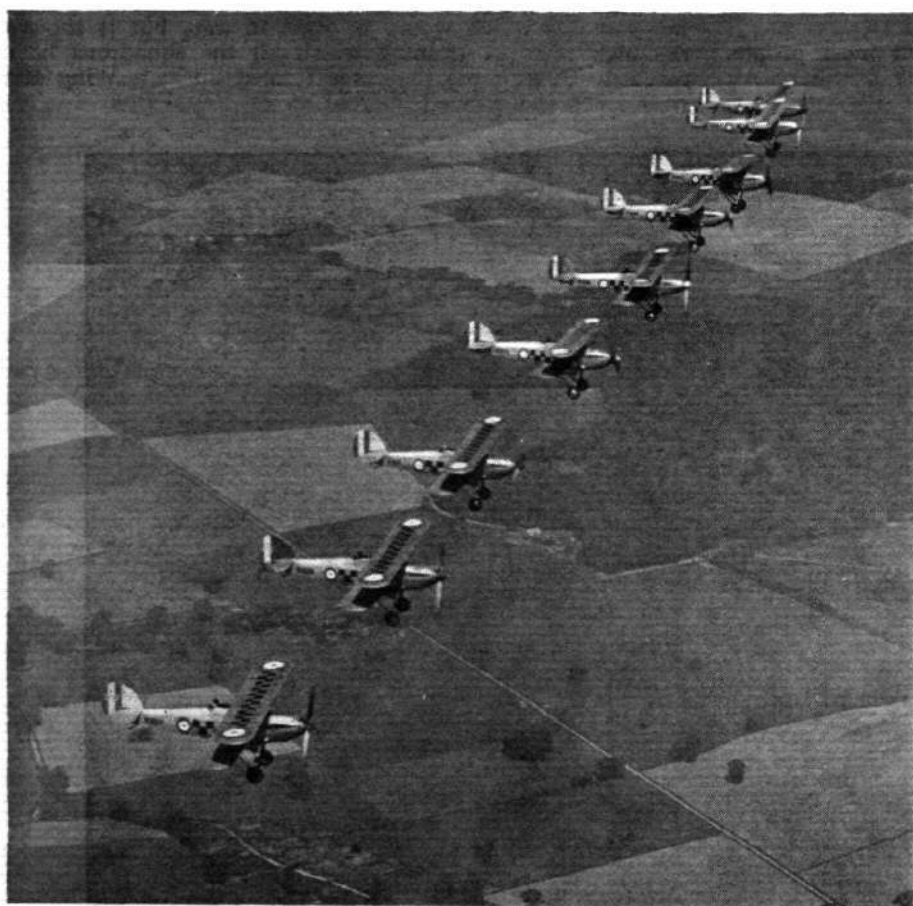
"Sidestrand" (two Jupiters), flown by Pilot Sgt. W. Methven, of No. 101 (Bomber) Squadron.

This is an event which always raises the greatest interest, and the way in which Sgt. Methven handled the "Sidestrand" brought back memories of the piloting of the late Sqd. Ldr. Longton in the Display some years ago.

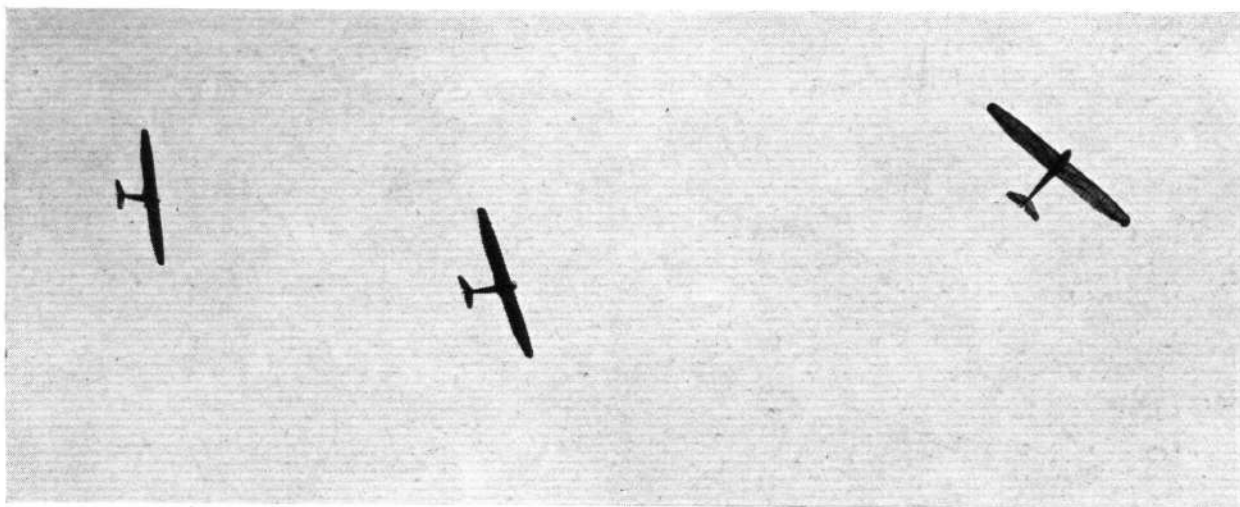
Last year we did not see this form of combat, so this is the first time it has been done with fighter aircraft as efficient as the "Bulldog." Those who knew anything of the capability of the "Sidestrand" confidently expected that it would win the fight, but the authorities decreed otherwise, although before it was shot down it had accounted for two of its assailants, which were sent down in "flames."

We, ourselves watched the event in company with two experienced pilots, both of whom thought that the "Bulldogs" would have lost the battle had the rear gunner been a good marksman. The pilot of the "Sidestrand" made the fullest use of his machine's exceptional manoeuvrability, and on many occasions he turned it even faster than were the "Bulldogs" turned. If desired it may actually be looped, rolled and spun with facility, and by way of showing his contempt for his adversaries Sgt. Methven looped neatly during the "action!" Time and time again he turned his big machine so that the rear gunner had splendid chances of getting a sight on the "Bulldogs," and there is no doubt whatsoever that had the fight been real the "Sidestrand" would have given a very good account of itself.

Having no engine in front of the fuselage obviates having to have the rear gunner standing in a heavy slipstream, and he can therefore work much more comfortably, while the gunner in the nose has a perfectly clear field, and moreover can obviously make more use of his gun than can the pilot of a single-seater fighter wherein the gun is fixed.



IN LINE ABREAST: No. 43 (Fighter) Squadron in another of their formations. (FLIGHT Photo.)



THREE "MISSING" ENGINES: The B.A.C. Gliders circling in line astern. (FLIGHT Photo.)

Flight Aerobatics

In this very fine Display there were many events in which even the most captious critic would find it hard to pick any holes. Incidentally nothing but the most severe criticism does justice to the Display. Sloppy praise for everybody would be unjust to those about whom no criticism is possible. In vain did we seek for any sort of flaw in the combined aerobatics by a flight of three "Furies" from No. 1 (Fighter) Squadron. Flt. Lt. O. E. Carter, F/O. T. R. Hope, and F/O. G. B. Kelly manœuvred their speedy aeroplanes with the unanimity of a winning Varsity crew. At the slightest indication from "stroke" they "picked it up"—or to turn from the jargon of the river to that of the air, they looped and rolled and banked. Coming "down stage" in flight formation, they started with a combined loop, then did a half roll, and changed to line astern. A sideslip turn changed direction, bringing them to a lower level. Then they did a loop in line astern—always a very effective manœuvre to watch—followed by a very slow roll. Next they formed up on the leader and did two loops in flight formation, followed by some steeply banked turns, in which one marvelled at the judgment with which the outside and inside men managed their throttles. The three machines went round as though joined together by invisible rods. No. 1 F.S. has not had "Furies" for very long, but there seems to be something in the air of Tangmere which makes for very high-class flying. Bravo! No. 1 F.S.!

Parachute Demonstration

This event was a demonstration by the Parachute Section

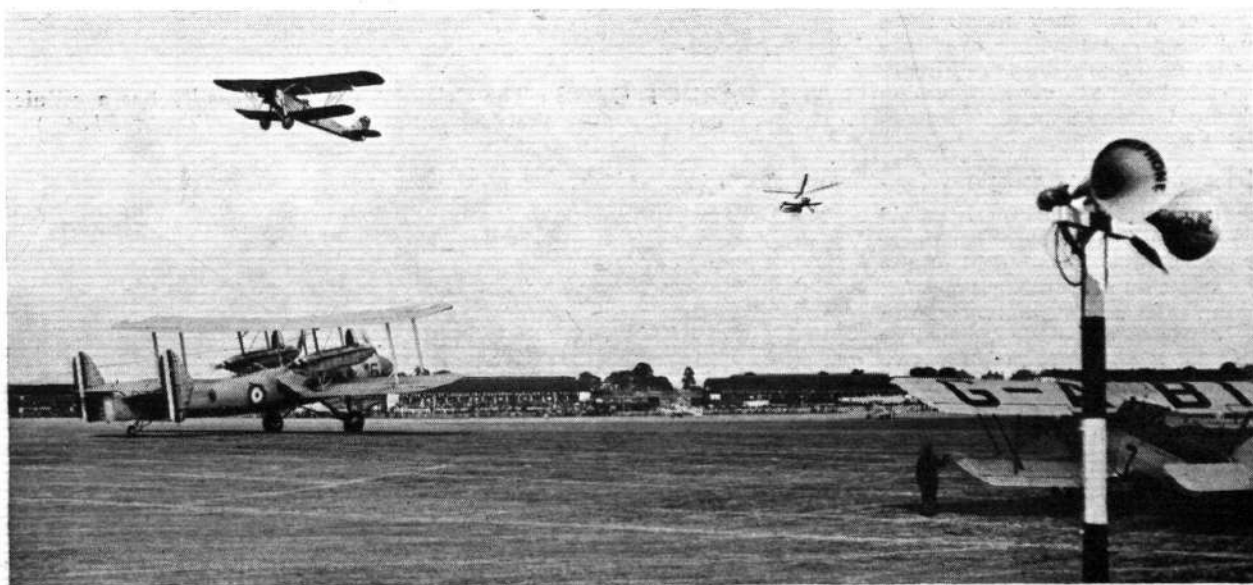
of the Home Aircraft Depot with the Irvin parachutes which are used in the R.A.F. In the ordinary way the method demonstrated would have been that employed in normal training, where the parachutists stand on the wings of the aeroplanes, and at a given signal release their parachutes when they are simultaneously "pulled off" the aircraft.

On Saturday, however, the wind was strong and gusty, and it was decided not to risk the chance of accidents by having "live" drops. The actual drops, therefore, were carried out on this occasion by six members of the Sandbags School of Parachuting (formed by the veteran Display participator Maj., now Wing Com., Sandbags). The machines used were three Vickers "Virginia" bombers (Napier "Lions"), which, when over the aerodrome, gently but firmly dismissed the six "parachutists," who (or which) floated gracefully to earth.

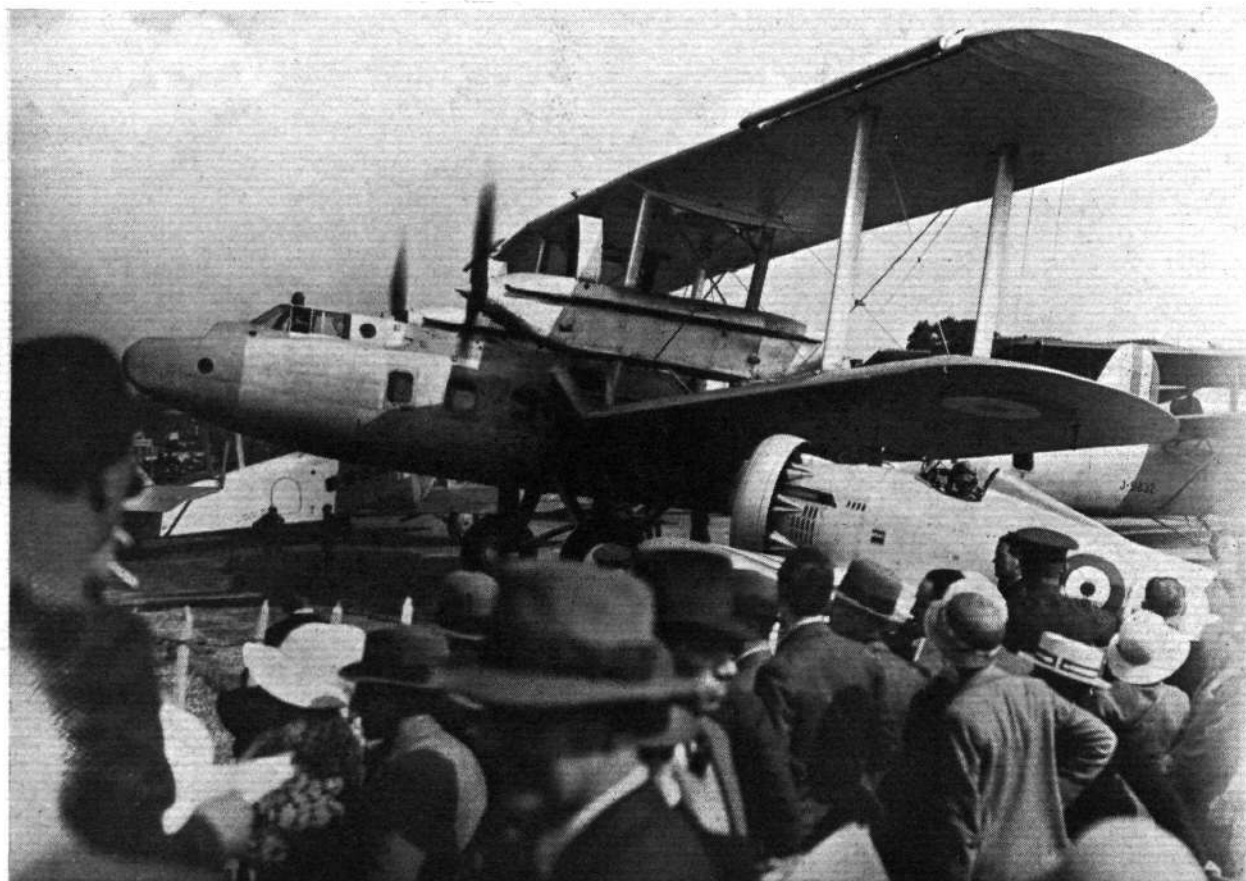
On the whole, we think the decision not to make it a "live" drop was a wise one, judging from the impact on landing made by the aforesaid members of the S.S.P.

"Gentlemen, You May Smoke"

The "stage," which previously had been somewhat overclouded, was now cleared for the next event, the main theme of the setting being pale blue, with heavy indigo clouds in the "wings." This event was smoke evolutions by three pilots of the Aeroplane and Armament Experimental Establishment, Flt. Lt. J. T. Moir and Pilot Officers A. J. Pegg and F. L. White, on Bristol "Bulldogs" ("Jupiters"). Smoke by Maj. J. C. Savage, of "Skywriting."



"OLD FRIENDS": The "Gugnunc" and "Autogiro" aviating above the Gloster Troop Carrier. (FLIGHT Photo.)



DIGNITY AND IMPUDENCE : The Gloster Troop Carrier and the Vickers "Jockey" emerging from the aircraft park. (FLIGHT Photo.)

These three opened their demonstration by writing "R.A.F." in orange and white smoke. Next, flying in close formation, they made a big spiral of orange, white and orange threads, followed by a gigantic loop of similar colouring. After this they flew across the aerodrome, one laying a white train of smoke, which the other two interwove with orange. The blending of the two colours as the smoke dissipated—which, unfortunately, owing to the strong wind, it did fairly quickly—produced a very pretty effect.

Three "pot-hooks" were next formed, after which they made three individual loops, extending over the greater part of the aerodrome. Finally they concluded a very pleasing "turn" by forming a huge "Prince-of-Wales' Feathers."

Squadron Air Drill

Once before (in 1930) No. 43 (Fighter) Squadron from Tangmere was chosen to show its air drill at the Display, and this year the honour fell on it again. To be chosen twice is an unusual distinction. We remember that No. 25 F.S. performed for two years running in the days when it was commanded by Sqd. Ldr. Peck. Since No. 43 was last seen at Hendon it has twice changed its commanding officer, which makes it all the more remarkable that it should have kept up its quality. As we said before, there seems to be something in the air of Tangmere, but certainly great credit must be due to Sqd. Ldr. R. H. Hanmer, M.C., who now leads this squadron. It was given just 15

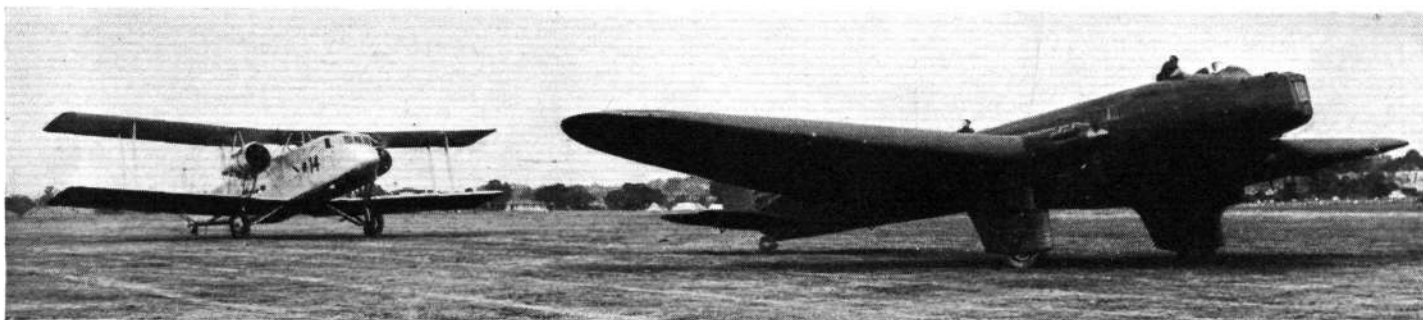
minutes for its turn, from 4.22 to 4.37 p.m. (the timetable works almost to split seconds), and in that time it managed to cross the aerodrome 10 times in 10 different formations. Only the speed of the "Furies" made that possible; but even that would have been vain had not the squadron training been so very good. The turns and the changes of formation were made at lightning speed. The formations were:—Squadron V; line abreast;



THE PARROT CAGE : The Bristol 120 ("Pegasus") has a celluloid wind covering over the rear gunner's cockpit. (FLIGHT Photo.)



A PRIVATE VENTURE : The Westland "P.V.6" ("Pegasus") is a general purpose aircraft. (FLIGHT Photo.)



"NEW AND EXPERIMENTAL": In front the Fairey Night Bomber (two "Kestrel"), and behind it the new Blackburn ten-passenger machine (two "Jaguar"). (FLIGHT Photo.)



FOR No. 100 (BOMBER) SQUADRON: The Vickers "Vildebeest" Torpedoplane ("Pegasus"). (FLIGHT Photo.)



A NEW NIGHT BOMBER: The Boulton & Paul "P.32" (three "Pegasus"). (FLIGHT Photo.)



UNORTHODOXY: The Handley Page 38 Night Bomber (two "Kestrel") has fuselage and engines placed under the upper wing. (FLIGHT Photo.)

U shape; equilateral triangle; three lines abreast (or three lines astern—it comes to the same thing); flights in line astern; broad arrow; T shape; a cross; and a dive in squadron formation, when the screaming note of the "Kestrels" seemed to send the temperature several degrees higher. It was a very breathless quarter of an hour.

This somewhat ambiguous term was taken to mean a park for new aircraft types, and not an aircraft park of new type. This event, No. 12 on the programme, was renamed this year "Parade and Fly-Past of Present and Experimental Types." The change in title was doubtless due to the fact that quite a number of the aircraft types

Glider Demonstration

This was an entirely new event and a novel one, which was very well received indeed by the spectators.

Three "Moths" from No. 24 (Communications) Squadron took off in formation towing three gliders of the B.A.C.VII type built by the British Aircraft Co., Ltd., of Maidstone. The gliders were flown by:—Sqd. Ldr. J. J. Williamson, Flt. Lt. L. T. Keens, and F/O. E. L. Mole, and the towing aircraft by Flt. Lt. L. C. Barling, F/O. R. F. Fletcher, and F/O. W. F. Pharazyn.

They climbed steadily to about 1,000 ft. while doing a wide sweep around the aerodrome, and then, when over the centre, they released the gliders. These carried on in Vee formation doing another wide left-handed turn before forming line astern and coming in to land.

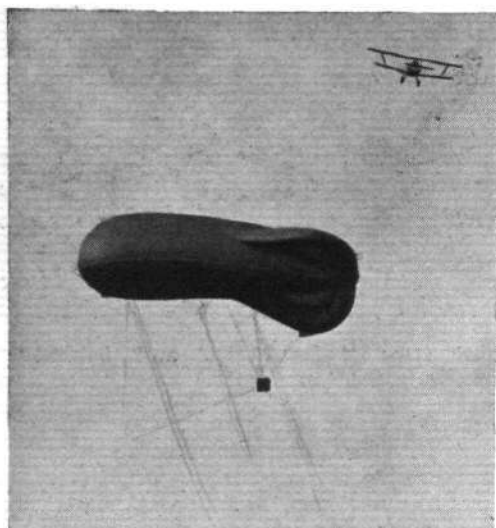
After the noise of the ordinary aircraft engines it was quite a relief to see these gliders handled expertly, doing turns and landing perfectly, all without any noise whatsoever. F/O. Mole is well known to our readers as a prominent glider pilot who has done a very great deal of soaring, and it is not surprising, therefore, that he was chosen to pilot one of these craft at Hendon.

The reason for the inclusion of this event was not disclosed, but it was gratifying to see the R.A.F. taking an interest in this form of flying, and particularly in the aircraft-towing form of launching. Those responsible for the revival in this country have had a long row to hoe to popularise it, and this official demonstration should help their efforts to provide the man in the street with flying at very little cost. It is doubtful whether it can have any Service significance, except perhaps for meteorological investigations in connection with air currents, but for training men to handle heavier than air craft it certainly has a great deal of use.

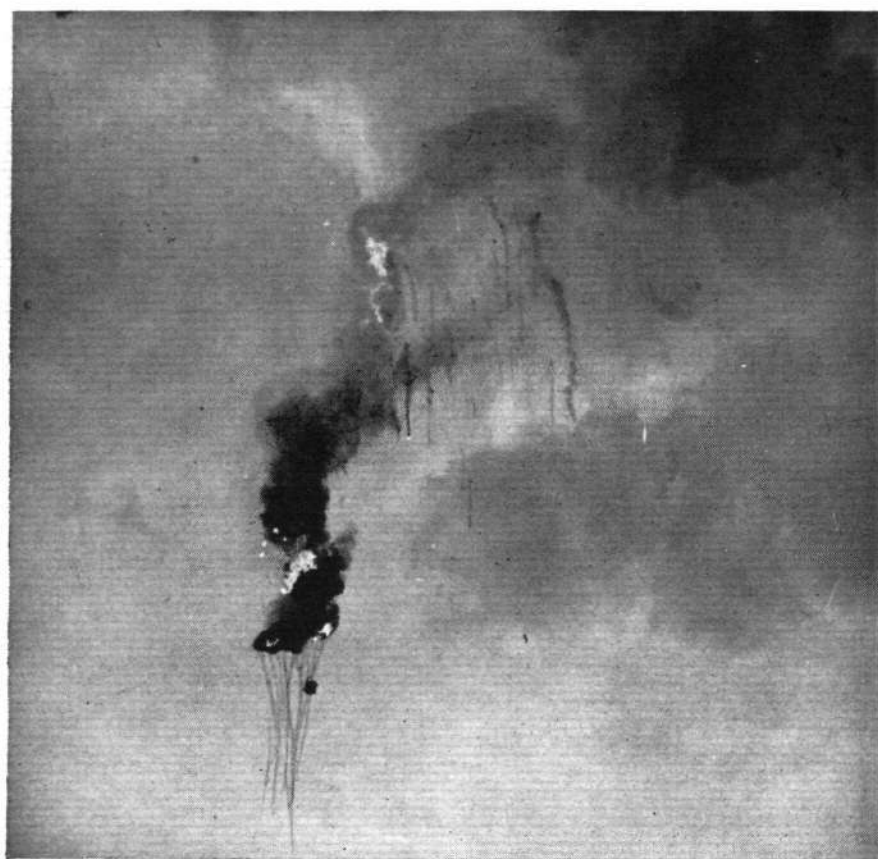
Anyway, it was something new for the people to look at at Hendon, and as such its inclusion in the programme was thoroughly justified.

The Parade

As in previous years, there was a parade and fly-past of the machines which had been on view during the day in the New Type Aircraft Park.



BEFORE AND—



AFTER : The Kite Balloon, after the departure of Wing Com. Dummy Sandbags was shot down in flames. (FLIGHT Photos.)

included were not quite new, and certainly no longer to be regarded as experimental.

Taxying out of their enclosure, and rather spoiling the effect of the three gliders, whose "noiselessness" was drowned by the roar of the twenty-odd engines, the fifteen "present and experimental" machines took off strictly in the order given in the programme. The item had been introduced by three "old friends," the "Autogiro," the "Gugnunc" and the "Pterodactyl," which showed off the particular characteristics each possesses. Slow-flying and nearly vertical descent were the features demonstrated by the Cierva and the Handley Page machines, while the "Pterodactyl," looking like a butterfly by reason of its new colour scheme, was splendidly handled by Flt. Lt. Stainforth. The perfect loop of the "Pterodactyl" indicated that there are now few evolutions which this type cannot perform, although it retains the freedom from stalling vices which was the *raison d'être* of Capt. Hill's first machine of this type.

The fifteen machines from the aircraft park flew around for a short time, but conditions were not very favourable for forming any really useful opinion of their capabilities, nor did the method of taxying out and taking off allow of showing what length of run the different types required. The smaller high-speed types were, as usual, the most spectacular, but to those who make a serious study of development there was, perhaps, more interest in watching the behaviour of the very new types, especially those which had not been seen in public before.

Many of the aircraft types which took part in this event were demonstrated at the S.B.A.C. Display at Hendon on Monday last, where one had a very much better opportunity to see what they can do, and readers are referred to pp. 601-603 for our impressions of these.

Here it will suffice if we give a list of the types which took part in the fly-past, and a brief mention of such of the types as were not represented at the private show on Monday last.

The fifteen machines, in the order in which they took off, were: Vickers "Jockey" ("Jupiter"), Hawker "Osprey" ("Kestrel"), Bristol "Bulldog III A" ("Mercury"), Hawker "Nimrod" ("Kestrel"), Westland "P.V.6" ("Pegasus"), Gloster Troop Carrier (4 "Kestrel"), Armstrong Whitworth "Atlas II" ("Panther"), Short "Valetta" (3 "Jupiter"), Bristol "120" ("Pegasus"), Vickers "Vildebeest" ("Pegasus"), Boulton & Paul "P.32" (3 "Pegasus"), Handley Page H.P. 38 (2 "Kestrel"), Fairey Monoplane (2 "Kestrel"), Blackburn ten-passenger biplane (2 "Jaguar"), and De Havilland "Tiger Moth" ("Gipsy III").

Of the machines seen in public for the first time, and which were not flown during Monday's private demonstration, the Boulton & Paul "P.32" bore a strong family resemblance to the "Sidestrand," the third engine, placed

in the top centre-section, not being visible from several angles of view. An unusual feature of this machine was the nearly square tailplane and elevator, of an aspect ratio lower than any seen since the early days of flying.

The Fairey night bomber, with its cantilever low-wing arrangement and ultra-careful streamlining, was a very fine sight in the air, and represents a new line of attack on the long-range night-bomber problem. Impressions of other types will be found in our account of the S.B.A.C. Display.

The Set Piece

Although the "plot" laid for the Set Piece this year was very much more war-like than the semi-peaceful ones of the last few Displays, somehow or other we were not particularly thrilled by this event. Personally we were much more excited when our aircraft swooped down upon hordes of many-coloured "Wot Knotts," scattering them in all directions, and then blowing *everything* up with terrific bangs.

The scene this year represented a main aerodrome of the Enemy, situated alongside a disused fort in which large quantities of bombs were stored. (This sounded *very* promising for a big bang.) The Enemy squadrons having been somewhat worrying, it was decided to carry out a heavy air attack to destroy this base.

Thus, a squadron of our Single-Seater Fighters came on the scene, and diving on to the Enemy aerodrome delivered a low machine-gun attack on the occupants. This had the effect of drawing the Enemy Fighter Squadron, which immediately took off in pursuit, and soon we saw the two rival squadrons fighting it out "off stage."

Meanwhile our Reconnaissance aircraft (Hawker "Audax" with Rolls-Royce "Kestrel") came along to have a look at things, and finding the Enemy Fighters "not at home" reported matters to H.Q.—who replied by despatching two squadrons of Bombers (Hawker "Horsley" and Fairey III F.). Feeling just a *little* uneasy the Enemy sent up a Kite Balloon to see how things stood, but our "Audaxeses" spotted it and rushed in to attack.

The Observer of the Kite Balloon (our old friend Maj., now Wing Com., Sandbags, who is now on the Extra Special Reserve) wisely departed per parachute, and shortly



THE HORNETS' NEST : The enemy aerodrome before the arrival of our aircraft. (FLIGHT Photo.)

after the K.B. stopped a tracer and also came down—in flames. The coast now being clear, our Bombers came on the scene, accompanied by bursting shells from the anti-aircraft guns. The Bombers made several journeys across the Enemy 'drome, dropping a salvo each time, and now and again one of our machines would fall out of the formation "in flames."

For all this, however, the amount of destruction appeared to be comparatively small—the hangars, it was true, were burnt out, but the flags remained fluttering in the breeze, and that store of bombs remained as silent dawn breaking.

However, we all thoroughly enjoyed this, and every preceding event too much to worry about little details like these, and so departed for home well contented, if somewhat tired.

The "actors" in this final event were:—No. 54 (Fighter) Squadron (Sqd. Ldr. S. L. G. Pope, D.F.C., A.F.C.); No. 111 (Fighter) Squadron (Sqd. Ldr. E. R. Openshaw); No. 207 (Bomber) Squadron (Sqd. Ldr. J. W. Woodhouse, D.S.O., M.C.); No. 504 (County of Notts) (Bomber) Squadron (Sqd. Ldr. C. T. Anderson, D.F.C.); No. 4 (Army Co-operation) Squadron (Sqd. Ldr. S. P. Simpson, M.C.).

Unofficial R.A.F. Display Programmes

A reader of FLIGHT has written in to complain that the unofficial programmes sold in Colindale Avenue are wholly inaccurate and misleading, and that many people bought them under the impression that they were official. This year's was the thirteenth Display, and one would have thought that by now very few people could be unaware that the official programmes are *not* being sold outside Hendon Aerodrome. If people *will* buy programmes for twopence and think they are getting reliable programmes "on the cheap," they have only themselves to blame. The official programme is excellent value at a shilling, and the proceeds of the sale go to charities. So why not buy it?

But apart from the ethics of unofficial programmes, a great deal of amusement may be got out of one. We ourselves were fortunate enough to secure one of these unofficial publications, and next year we shall get all we can. They seem to be worth it. The one that came our way informed its purchasers that at 11.0 a.m. there would be "Pilmenary Events." The "Demonstration by Bomber Transport" would show "the guarding of wells in desert from evening tribesman, introducing parachutist." The Fly-past was to include "Bombers troops." Among the new types were to be "New Night bombers FAIREYS—low winged Monoplanes." The Fighters were to include "Bulldog Siskin," and among the interceptor fighters was the "Furry." In the day bomber class was found the "Waspie," while the torpedoplanes included the "Vildebrest."

Worthy of official adoption are the names given to the troop carriers. These are named the "Clivo" and the "Viclonia." The Fleet Air Arm was evidently felt by the compilers to be worthy of inclusion (with which we fully agree. The converging bombing of former years was sadly missed), and was credited with "Fleet Sporter Reconnaissance" machines.

This priceless publication did not forget the social side of the Display, and informed its readers that General Balbo, "Itchian Minister for Air" was expected to fly from Geneva.

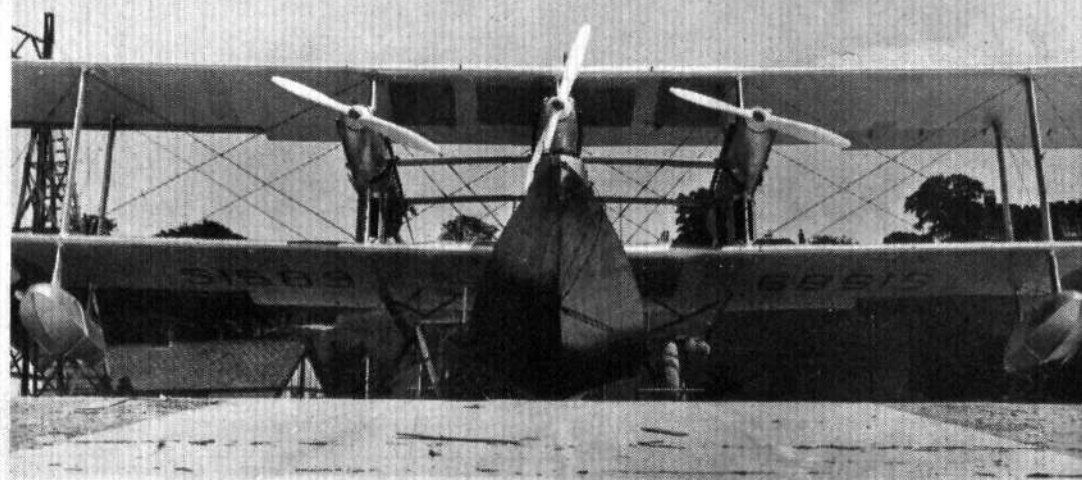
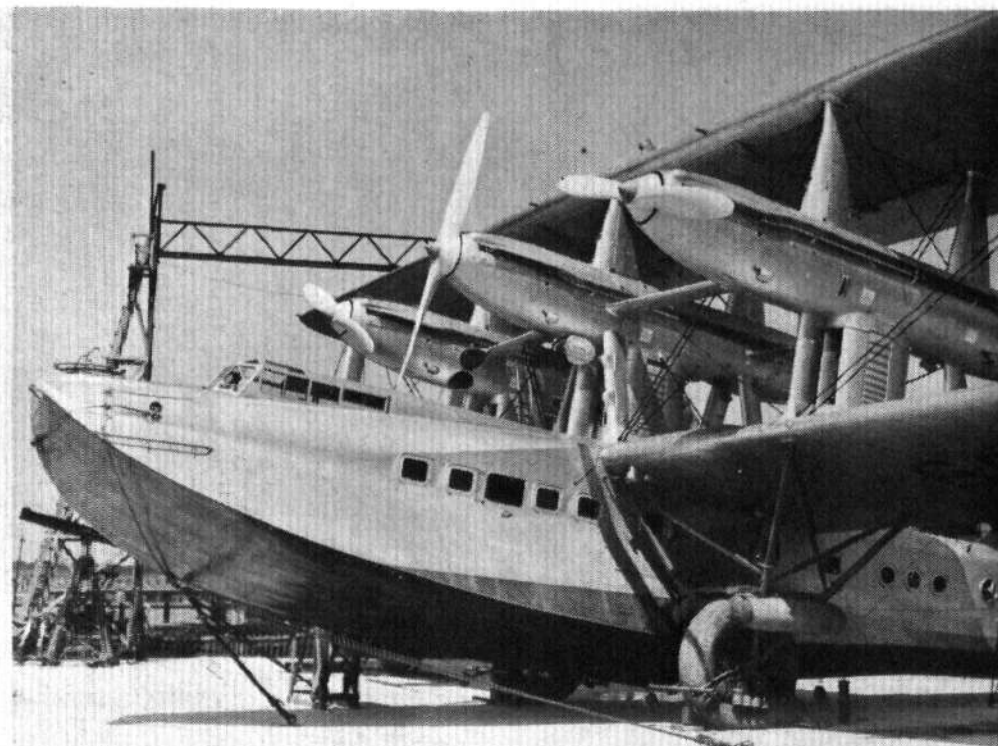
Under the heading "Expected to attend" was the following sentence: "Three Vickers Troods carrying planes are sister ships to those which for three days have been carrying troops from Egypt to Iraq."

But perhaps the most unintentionally funny thing in the whole programme was the last line, which said that "The King and Queen are liable to attend." The back cover showed a Fairey machine with stationary airscrew, and the caption was "A Plane taking off." We congratulate J. C. W. on his production. It deserves to become a classic.



SMOKED OUT : The same when the attackers had finished with it. (FLIGHT Photo.)





THE LATEST OPEN SEA RECONNAISSANCE MULTI-SEATER FLYING-BOAT : This new six-engined Short machine has just been launched at the Rochester works of Short Brothers. The engines are Rolls-Royce " Buzzards." (FLIGHT Photos.)

The S.B.A.C. Display

For the first time in the history of British aviation the S.B.A.C., in collaboration with the British Air Ministry, held a combined Aero Show and Flying Display at Hendon on Monday last to which admission was by invitation only. A large number of representatives of foreign nations took the opportunity to be present and to see for themselves the excellence of British Aircraft, Aero Engines and other material

ALTHOUGH it was arranged at rather short notice, the Flying Display arranged by the S.B.A.C., with the co-operation of the Air Ministry, at Hendon last Monday must be counted a success. The idea of holding such a demonstration soon after the Royal Air Force Annual Display at Hendon is thoroughly sound, and deserves to become as regular a feature as the R.A.F. Display itself. For our own part, we feel that the S.B.A.C. made a great mistake in ruling that no photographers were to be admitted to the show on Monday last. Here was an unrivalled opportunity for letting journals like *FLIGHT* show the world in pictures all the latest British types of aircraft, service and civil. As there is scarcely a country in the world in which *FLIGHT* does not circulate, the value to the British aircraft industry of a fully-illustrated issue dealing with these products would have been very great indeed. As it is, we have to content ourselves with a description of what happened during the day.

Admission to Hendon on Monday last was by invitation card only, and the general public were not admitted. The invitations had been accepted by a great number of foreign representatives, and Hendon aerodrome presented, in spite of the "Hampstead-Heath-after-a-Bank-Holiday" appearance left by Saturday's visitors, a very animated scene. German, French, Italian and a host of other tongues were heard on every hand, and in some instances the language difficulty was a fairly serious one. This makes it advisable to offer, at this juncture, a suggestion for the improvement of the next S.B.A.C. Display. The organisers know beforehand which nationalities are attending and in what numbers. It would be courteous, and probably good business policy as well, if interpreters were made available so that for each nationality attending in any considerable numbers an interpreter was placed at their disposal who would conduct them around the aircraft park. In the case of many of the nationalities represented on Monday, the air or other attaché in London acted in this capacity, but not all nationalities have attachés or other suitable representatives with sufficient aircraft knowledge to make good interpreters.

The programme for the day included an inspection of the aircraft on the ground during the morning, from 11 a.m. to 1 p.m., when the luncheon interval began, and a flying display of the various types during the afternoon, followed by passenger flights.

A most imposing array of aircraft were lined up in the S.E. corner of the aerodrome, and the visitors were busy inspecting them from 11 a.m. onwards. Prominent among those who closely examined all the machines was the Italian Air Minister, Signor Italo Balbo, with a large *entourage*, in which was included Lt. Col. Bitossi, Italian Air Attaché in London.

To convey an idea of the number and variety of aircraft on view it is necessary to give a complete list of the machines present. Sir W. G. Armstrong Whitworth aircraft were represented by the new "Atalanta" commercial monoplane (four "Double Mongoose" engines of 340 h.p. each). This machine came in for much admiration as one of the largest and "cleanest" British civil aeroplanes ever produced. In addition to this machine, the firm was represented by the "Atlas Mark II" ("Panther" engine) and the A.W.XVI ("Panther") single-seater fighter.

The Blackburn Aeroplane & Motor Co., Ltd., was represented by three types: The new ten-passenger biplane (two "Jaguar IV C" engines), the "Segrave" (a modernised version of the Segrave "Meteor") with two "Gipsy III" engines, and the new "B2" light trainer biplane. An illustration of the ten-passenger machine was

published on p. 564 of last week's issue. The machine is of all-metal construction, with corrugated light-metal fuselage covering. The little "B2" is a development of the Blackburn "Bluebird," and has its fuselage covered with sheet metal, very neatly applied. Like the "Bluebird," it is a side-by-side two-seater. The engine is a "Gipsy III."

Three aircraft were to have been displayed by the Bristol Aeroplane Co., Ltd., but at the last minute the "120" ("Pegasus") was withdrawn, although the machine was actually in place when the gates opened in the morning. Whether or not the withdrawal was by order of the Air Ministry we have no knowledge. The celluloid "parrot cage" for the gunner may have been thought too startling to spring on unsuspecting visitors. There remained the "Bulldog III A" ("Mercury") and the "Bulldog" T.M. ("Jupiter"), a two-seater "Bulldog" designed for advanced training. The "Bulldog III A" is a modernised version of the older machine of that name, and is believed to be the fastest single-seater fighter in the world fitted with an air-cooled engine.

On the de Havilland "stand" were three types: A "Fox Moth" ("Gipsy III"), a "Puss Moth" ("Gipsy III"), and a "Tiger Moth" ("Gipsy III"). All three types are familiar to our readers, but many of the visitors very evidently were delighted to make the acquaintance of the machines "in the flesh." The comfort of the "Puss Moth" and the obvious economy of the "Fox Moth" appeared to impress the visitors.

We believe that originally it had been intended to have four machines on view by the Fairey Aviation Co., Ltd., one of these to be a "Fox II" ("Kestrel"). However, this machine was absent, and a "III F" had taken its place. The "Firefly III" ("Kestrel"), the "Gordon" ("Panther") and the "III F" ("Lion") were none the less admired because they are well known, but the greatest attraction was undoubtedly the night-bomber monoplane (two "Kestrel"). This low-wing cantilever monoplane has been extremely carefully streamlined and shows a frontal area surprisingly small for such a large machine. The "trouser" undercarriage, with the two radiators placed immediately ahead of each "trouser leg," is an example of how trouble has been taken to reduce drag. Of the performance nothing may be said, but there is no doubt that for a machine in the night-bomber class this new monoplane is very fast.

The Gloster Aircraft Co., Ltd., made up in size what it lacked in the number of its exhibits. The troop carrier is a very large machine, yet so well proportioned is it that one is apt to fail to realise its size. The Gloster "tin bashers" have made a wonderfully fine job of applying the metal covering of the fuselage, and nowhere did one see either discontinuity of line or scratch marks of any sort on the Duralumin skin, which is laid on in small panels.

The fact is now no longer a secret that the four Rolls-Royce "Kestrels" are steam cooled, and that it is this which accounts for the small size of the radiators, the "Gothic" architecture of which was praised by some visitors and rather criticised by others. Incidentally, it is interesting to note that the tractor and pusher engines are different, the "Kestrels" being two Mark II's and two Mark III's. The object is evidently to provide suitable gear ratios to the two pusher engines, so that the airscrews working in the slipstream of the two tractor screws may work at the highest attainable efficiency.

A service, a commercial and a comic type were presented by Handley Page, Ltd. The service type was the H.P.38 (two "Kestrel") night bomber, and the commercial machine was "Helena," one of the H.P.42 type (four

"Jupiter") belonging to Imperial Airways, Ltd. The comic touch was provided by the "Gugnunc" ("Mongoose").

The unusual appearance of the H.P.38, with fuselage and engines elevated to top plane level, attracted many visitors, and there is no doubt that the exceptionally clear view and field of fire provided by this arrangement impressed the onlookers as having a great deal to recommend it. Later in the day, the spectators were equally impressed by the flying qualities of the machine. The H.P.42 type is already known to all, but the comfortable cabins were much admired by the foreign visitors.

The H. G. Hawker Engineering Co., Ltd., had four types on view, or rather three types and a variation of one. They were a "Horsley" ("Leopard"), a standard "Hart" ("Kestrel"), a "Fury" ("Kestrel"), and a "Jupiter"-engined "Hart." The latter looked quite unfamiliar with its air-cooled engine. It is understood that it is going to Sweden shortly to give demonstrations. The clean lines and generally graceful appearance of the Hawker machines were commented on by many, and the afternoon's demonstrations were looked forward to expectantly.

A very strong show was made by A. V. Roe & Co., Ltd., with no less than four types. These were a type 627 "Mailplane" ("Panther"), a type 626 ("Lynx") advanced training type, a type 621 "Tutor" ("Lynx"), and a type 631 "Cadet" ("Mongoose").

The Avro "Mailplane" in its bright yellow paint made quite a landmark on the grass, and was very quickly a centre of attraction. This machine, it will be recollected, was designed specially with Canadian air mails in view, and the machine made a tour of Canada and was reported on by all as being very suitable for the work, but Canada had no money to spend on mailplanes. With its high cruising speed and quite large mail load, it should be a very useful type in many parts of the world other than Canada, and it seems extraordinary that it is not yet in regular use.

The other three Avro machines showed the remarkable range of training types which this firm now has in the market, with the little "Cadet" as the lowest-powered and cheapest of the three, the "Tutor" as the more powerful and very robust flying training type, and the 626 for specialised training in gunnery, photography, wireless, bombing, etc.

Saunders-Roe, Ltd., had confined their part of the show to a single machine, the Saro "Cloud" (two "Double Mongoose"), which is an amphibian flying boat used both for civil and service purposes. In the former capacity it will carry 14 passengers, which is remarkably good for an amphibian type of this power, and as a service type its particular merit is that it makes a wonderfully useful machine for general instruction and for navigation instruction, its ability to start from a seaplane station, for example, and alight at any land aerodrome within its range making straight-line navigation possible.

Of the two types shown by Spartan Aircraft, Ltd., the three-seater was already known to many of the visitors, but the "Cruiser" was novel to most and was much praised for its general appearance and its very comfortable and well-lighted cabin. The "Cruiser" is fitted with three "Gipsy III" engines and has seating accommodation for six passengers in very comfortable chairs. The machine has an all-metal fuselage of the stressed-skin type, while the cantilever wing is of wood construction with plywood covering.

The Spartan three-seater is a light aircraft fitted with "Hermes II" engine, and is a type very economical to operate.

The two aircraft by which Vickers (Aviation), Ltd., were represented were both in the new aircraft park at the R.A.F. Display, *i.e.*, the "Jockey" interceptor fighter ("Jupiter") and the "Vildebeest" ("Pegasus") torpedoplane.

The "Jockey" is a low-wing monoplane of all-metal construction, including the covering. In size it is quite diminutive, and was easily the smallest service type of aircraft on view at Hendon. The "Vildebeest" has been designed primarily as a torpedoplane, but can also be used as a bomber. The type has been chosen as the standard equipment of, and will shortly be issued to, No. 100 (Bomber) Squadron.

The Westland Aircraft Works showed two types, one service and one civil. The service type was the P.V.6 general-purpose aircraft ("Pegasus") and the civil the "Wessex" (three "Genet Major").

The P.V.6 is, as the letters indicate, a "Private Venture," *i.e.*, not designed to any particular Air Ministry specification. The machine is a development of the famous "Wapiti," of which very large numbers have been built, and has a very good performance.

The "Wessex" is a small three-engined commercial machine, and is very highly regarded as a very economical type. It is in use by the Belgian SABENA lines, and on shorter routes in Great Britain.

Engines and Accessories

In addition to the aircraft on view on the aerodrome, considerable numbers of aero engines and accessories were exhibited in tents in the enclosures. Space does not permit of a detailed "stand-to-stand" report, but it may be of interest to mention quite briefly what the different firms exhibited.

Armstrong Siddeley Motors were represented by a "Panther" of 535 h.p. The Bristol Aeroplane Co. by a "Pegasus," Series I, of 555-615 h.p. A "Gipsy III" of 120 h.p. represented the de Havilland firm, and a "Lion XIV" Napier & Sons. The Rolls-Royce exhibit was a supercharged "Kestrel."

Among the accessories, etc., the following firms were showing, the nature of the exhibits being indicated after each firm in parentheses:—Auster (windcreens); B.T.H. (magnetos); Brooke Tool Manufacturing Co. (metal parts for aircraft); Brown Brothers (accessories and components); Cellon (dopes, lacquers and varnishes); Dunlop Rubber Co. (aircraft wheels and brakes); High Duty Alloys (stampings, forgings and castings); H. Hughes & Son (compasses and navigation instruments); Marconi Co. (radio receiving and transmitting apparatus). The Palmer Tyre (aeroplane wheels and brakes); Siebe Gorman (oxygen apparatus); Smiths Aircraft Instruments (navigational equipment, engine, oil and fuel recorders, sparking plugs, etc.); Standard Telephones (radio apparatus); J. Stone & Co. (castings, bearings and small parts); Titanine-Emallite (dopes, lacquers and varnishes); Williamson Manufacturing Co. (cameras, etc., for aerial photography).

The Luncheon Interval

At 1 p.m. there was an interval for lunch, and hosts and guests sat down to a very cheery gathering of the friendly and informal kind which is so useful for establishing really friendly relations. At the end of the luncheon Sir John D. Siddeley, who is chairman of the Society of British Aircraft Constructors, said a few words, but as two Handley Page aeroplanes were flying about in front of the hangar doors just at that moment, it was almost impossible to hear what Sir John said. From the few snatches which we were fortunate enough to catch, we gathered that Sir John said that the British aircraft industry was indebted to the Air Ministry and the R.A.F. for the prominent position which the industry occupied at the present time. He also pointed out that the R.A.F. was helping to establish a lead in air transport similar to that which the Royal Navy had in the past enabled Great Britain to secure in sea transport. In this country, Sir John said, we believed firmly in the importance of air transport in the future.

The Flying Display

While the luncheon party was breaking up, two Bristol aeroplanes gave a fine demonstration of various evolutions. They were the "Bulldog III A" single-seater fighter, and the "Bulldog" two-seater advanced training machine. The former machine is certainly very fast, and is, we believe, claimed to be the fastest machine of its type equipped with an air-cooled engine.

The three Armstrong-Whitworth machines were the next to be demonstrated. Like the "Bulldog III A," the "A.W.XVI" is certainly a very fast machine, and a race between the two would be extremely interesting. Owing to its novelty, the "Atalanta" commercial monoplane was the type to arouse the greatest interest. The machine looks beautiful in the air, and appears to have a very good speed range. Mr. Campbell-Orde had flown it down from Whitley (Coventry) in 40 min., cruising at about 120 m.p.h. Photographs of this machine will be found on page 606.

The Saro "Cloud" showed a good turn of speed, and was well handled. With its amphibian undercarriage there should be few places in the world to which it could not go.

The de Havilland "Fox Moth," "Puss Moth" and "Tiger Moth" were demonstrated next. Their flying was

as usual smooth and "finished" and created a good impression. A demonstration of the effectiveness of the differential wheel brakes of the "Fox Moth" was very convincing.

The four Hawker machines demonstrated were:—The standard "Hart," the "Hart" with "Jupiter" engine, the "Fury" and the "Leopard-Horsley." The evolutions of these machines were very impressive, but a cable picked up on the tail skid of the "Jupiter-Hart" caused some anxiety. However, it caused no damage other than detracting somewhat from one's enjoyment of the Hawker demonstration.

The "Hart" gave a remarkable display of acceleration. After flying at very low speed, the pilot suddenly opened the engine to full throttle (one suspects that he "went right through the gate") and immediately put the machine into a nearly vertical climb.

The Gloster troop-carrier flew very well, and looked remarkably small in the air. Of performance it was difficult to form an opinion, as the machine was "flying light," but its turn of speed appeared very good and the landing speed seemed very low.

The Fairey demonstration was confined to a display of the "Firefly III" Fleet Fighter. As usual, Mr. Staniland put up a very spectacular performance, his upward rolls, inverted glides, and slow rolls at low height being particularly admired. When the machine came roaring across at low height, the speed seemed terrific, and the subsequent "zoom" was breath-taking.

The two Spartan machines, the three-seater and the six-seater "Cruiser," gave good shows. The new "Cruiser" looks extremely well in the air, and seemed very quiet. We have not been in the cabin yet, but one would expect the noise to be very moderate. The three-seater gave a quite remarkable demonstration of "sitting still" in the air. One suspects that it was flown by Col. Strange. The machine did not appear to be fitted with slots, which makes the performance all the more remarkable.

The Blackburn B2 Trainer and the "Segrave" were next to take the air. Both were well handled, but the pilots confined themselves to straightforward flying and did not attempt any spectacular turns. However, the demonstration was none the worse for that.

The Vickers "Jockey" single-seater fighter gave a fine

demonstration of high-speed dives and "zooms," and looked very fast, although it is possible that its small size may have caused it to look just a little faster than it actually is. The "Vildebeest" showed the tactics followed in torpedo-dropping. The machine dives on its target, then flattens out and drops the torpedo from a low height. On this occasion one had to imagine the dropping of the torpedo, as aerodrome grass is not the best possible receptacle for this type of missile.

The Avro display was typical of the excellent controllability and manoeuvrability of the three types of training machines, the 626, the 621, and the 631, while the "Mail-plane" showed a remarkable turn of speed.

The two Westland machines were well handled, the "Wessex" doing fast and slow flying, while the "P.V.6" concentrated on showing its excellent climb, and did tight, vertically-banked turns of very small radius indeed.

The display came to a close by a second appearance of the two Handley-Page machines. The H.P.38 seems to hang in the air almost as well as the "Gugnunc," and appeared extremely controllable for such a large machine. Its speed range also seemed to be above normal.

The rest of the afternoon was devoted to passenger flights, and many of the machines, both military and civil, were kept busy until evening.

Altogether, the S.B.A.C. Display must be voted a success. More than one British firm expressed the view that the display had been of more real value than ten Paris Aero Shows. It is not difficult to think of improvements, but a very good start has been made, and it is to be hoped that the event will become an annual one. But in the future a little more time will have to be given exhibitors. The notice this year was rather short, and the display might have been even better attended. Also, one day is really hardly enough for anyone to see all the machines, engines and accessories. Next year it would be advisable to make it at least a two-day affair, with "ground viewing" on the first day and flying display on the second. This year each firm was, we believe, given 8 min. for their display. The firms which had three or four machines present thus had to rush their demonstration through. If a whole day could be set aside for the flying display, each type of aircraft could be demonstrated to better advantage.



FOR ADVANCED TRAINING: The Bristol two-seater "Bulldog" ("Jupiter") was one of the new types demonstrated at the S.B.A.C. Display at Hendon on Monday last.



Endurance of the "Sidestrand"

ON page 549 of last week's issue, in the data relating to the Boulton & Paul "Sidestrand III," the endurance at cruising speed was erroneously given as 4.6 hr. At a constant height of 15,000 ft. this is actually 6 hr., while

by judicious choice of height and cruising speed it may be extended to about 7 hr.

We regret the mistake, and would ask readers to make the necessary correction in their copies of FLIGHT.

PRIVATE FLYING & GLIDING

READING

The fine weather we have been experiencing of late has increased the amount of flying which has been done at the Phillips & Powis School of Flying very considerably. Among the new pupils who have joined during the past week are Lady Diana Gibbs and Mr. George Kurien, the latter of Travancore, in India. The Sales Department are still increasing their volume of business and have recently disposed of five "Moths," one being a new one to the Duchess of Bedford. Night flying continues to form a great attraction on Sunday evenings and the blind flying course is attracting quite a large number of pupils. In connection with this latter, Mr. C. W. Scott distinguished himself, and in doing so paid tribute to the instruction he had received, by shutting off his engine right over the aerodrome after flying a triangular course around Reading, Basingstoke, Newbury and back, solely by instruments.

BROOKLANDS

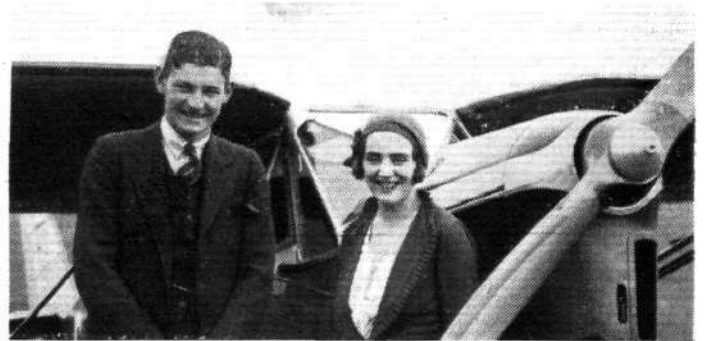
A cross-country competition is being organised by the Brooklands School of Flying for the Shipwright Trophy. This competition will be open to all pupils of the school, to members of the Brooklands Aero Club and the College of Aeronautical Engineering Aero Club who have not put in more than 100 hr. solo flying. The competition is designed to encourage accurate map reading and cross-country flying. For this purpose the competitors will be allowed to choose their own day and time upon which to fly up to the end of July. On starting they will be handed a map with three turning points, starting and ending at Brooklands, marked on it. They will then be allowed 15 min. in which to plot out their courses. A cruising speed of 80-90 m.p.h. at an altitude of not less than 1,000 ft. must be maintained and an instructor will be carried in the front cockpit who will mark the actual course flown on a duplicate map. On the return to Brooklands each competitor will have to carry out a forced landing in the circle. Marks will be given for the best course flown and for the most accurately judged forced landings. There will be no entrance fee charged for the competition but each competitor will have to pay the usual rates for instruction less 20 per cent. The winner of the closed aircraft class in the Concours d'Elegance on Sunday, June 26, was the Duchess of Bedford with her "Puss Moth" (Gipsy III), who received the *Tattler* Cup, and the winner of the *Gale & Polden* Cup for the open aircraft class was Mr. A. F. Wallace with his "Moth" (Gipsy I). Over 200 people took tea during the afternoon, and all enjoyed themselves thoroughly.

NEWCASTLE AERO CLUB

Saturday, August 6, is the date which has now been fixed for an air meeting at Cramlington. The London-Newcastle race for the *Evening World* Trophy which had to be abandoned on Saturday, May 28, will also be held in conjunction with this meeting.

HANWORTH

As has been the experience of the other flying clubs during the week, the fine weather has caused a sudden access of flying energy at Hanworth. Not only has a large amount of instruction been done as a consequence, but also a very considerable amount of taxi work. Among the trips made was one with the Secretary of the National Safety First Association to Glasgow. On Friday H.R.H. Prince George arrived by air and continued his journey to London by car. Capt. W. Raue, the British Vice-Consul at Hanover, with two students of the Technical High School, were passengers in two "Klemms" (Salmson) and one "B.M.W." (Argus) which arrived on Friday. All three machines were flown by pilots who are also students at the school. The excellent formation flying of these pilots has created quite a demand for their services in Germany for advertising purposes. On Saturday morning we saw them cross the eastern end of Hendon Aerodrome some time before the display started, while on Monday they again visited Hendon during the S.B.A.C. display, and landed there. As already announced, the *Graf Zeppelin*, it is hoped, will be arriving at Hanworth on Saturday afternoon.



Mr. L. M. J. Balfour and Lady Myrtle Balfour, who is a daughter of Lord Jellicoe. Mr. Balfour is a Director of Portsmouth & Isle of Wight Aviation, Ltd., the company which is running the new Portsmouth Aerodrome at Hillsea, to be opened on Saturday, July 2.

THE FUTURE OF GLIDING

All those who have the welfare of the gliding movement at heart should purchase a copy of the *Sailplane* for June 24. This is the official organ of the British Gliding Association and in the leader is a plea for an endowment fund. Anyone who cares to send contributions should do so to the Secretary of the British Gliding Association, 19, Berkeley Street, London, W.1.

AT LYMPNE

Among those who have cleared Customs at Lympne this week were Mr. and Mrs. O. Thaning, Mr. Thaning being a Danish Vice-Consul in South Africa. He recently flew from Cape Town to Cairo, in his "Puss Moth" ZS-BBC, in six days. On June 23 Mr. Brie passed through on his way to Copenhagen in the Autogiro, whilst Mr. James has been backwards and forwards from Paris.

On June 22 the club had two soloists in Messrs. Cann and Gordon. Mr. Gordon, who is motoring back to Cairo to rejoin his regiment, suddenly awoke to the fact that he had only two days left in which to pack and get his "A" licence, and he had not even gone solo. He started on dual landings at 3 p.m., went solo an hour and a-quarter later, and did his first hour's solo flying straight off. The next morning he completed his three hours, passed all his tests with flying colours, and went home to do the packing entailed by a four year's absence, before catching the afternoon boat from Dover. It is a little difficult to decide whether this splendid effort reflects greater credit on the instructor or on the pupil.

HERR H. KRAUSE

On Saturday, June 4, during the meeting of the German Olympic Committee in the Stadium at Berlin, Herr Hans Krause was unable to extricate his aircraft from an intentional spin and the resulting crash caused his death. It will be remembered that Herr Krause demonstrated a glider in conjunction with J. Lyons & Co. in this country last summer, during which time he also took part in the cross-Channel gliding attempt.

TWO INTERESTING GLIDERS

Reference to our advertising columns will disclose the fact that the British Aircraft Co., Ltd., of Maidstone, are selling their "Bat Boat" and also their "B.A.C. IX." The former is a very interesting type of glider which may readily be operated by a speed boat and photographs of this appeared in *FLIGHT* for December 11, 1931. As an advertising medium or for passenger carrying at seaside resorts this boat should prove a very profitable investment. The little "B.A.C. IX" is a small sailplane built so that it may be dismantled very readily and has, in the hands of a capable pilot, an excellent performance. This machine was originally designed so that the finished parts could be bought by clubs whose members would then be able to erect the machine themselves. A description of this machine appeared in *FLIGHT* for December 18, 1931. Unfortunately the company has so much work on hand that they do not feel justified, owing to the work entailed, in marketing these two types.

AIR TRANSPORT

THE COMMERCIAL AIR LINES OF GREECE

DETAILS of some of the commercial air lines operating in Europe are not, we believe, generally known to many of our readers, as, for instance, those of the ancient country of Greece. We think, therefore, the following notes concerning air transport in that country, together with the accompanying illustrations, will be of interest to our readers in general.

The Greek Republic has a population of approximately 8,000,000, of which 40 per cent. is concentrated in the principal towns of Athens, Piræus, Salonica, Patras, Volo, Jannina, Agrinion. The configuration of the country makes railway communications difficult, and there are only two principal lines. These are the railways of the State and of Thessaly connecting Athens with Salonica, and the Peloponese Railways connecting Athens with Patras and Calamata.

The distance between Athens and Salonica is covered in 12 hr. by train, whereas the sea journey takes 20 hr. Communication between Athens and both Jannina and Agrinion is very difficult, the journey to Jannina taking 30 hr. and to Agrinion 18 hr. by steamer, train and motor car. Greece is therefore a country peculiarly suitable for the development of aerial transport, and in 1931 an air service was started which has reduced the time between Athens and Jannina to 2½ hr., Athens and



The river Axelos as seen from the air.

Agrinion to 1 hr. and Athens and Salonica to 2 hr. The company which operates these services is the Hellenike Eteria Énaerion Synghinonion A.E. (Greek Air Traffic Co., Ltd.), originally formed under the name of "Ikaros" N. Cambanis & Co. in June, 1931.

The capital of the company is 28,500,000 Drs. wholly paid up and divided into 19,000 shares of 1,500 Drs. each. The company is subsidised by the Greek Government, and for the first four years the subsidy per kilometre amounts to 42 Drs. net. As the total annual distance to be flown according to schedule is 346,320 km., the total subsidy per annum will amount to 14,549,000 Drs. The E.E.E.S.—as this company is known for short—has, for a period of six years, the sole privilege of transporting passengers, mail and merchandise by air over Greek territory, and has the right to operate air communications between Athens-Crete, Athens-Egypt, with an extension of the Salonica route to Europe via Serbia and Bulgaria, and of the Jannina route to Corfu, Italy, Albania. The head office of the company is situated at Sofokleous 8, Exchange Building, Athens.

E.E.E.S. operate four Junkers G.24 16-seater monoplanes, fitted with three 280 h.p. Junkers L.5 engines. The lettering and names of each aircraft are as follows:—SX-ACA, *Athinai*; SX-ACB, *Thessalonika*; SX-ACD, *Jannina*; SX-ACE, *Patrai*.

The company has a flying staff of 4 German first pilots, 4 Greek second pilots, 3 wireless operators and 3 mechanics.

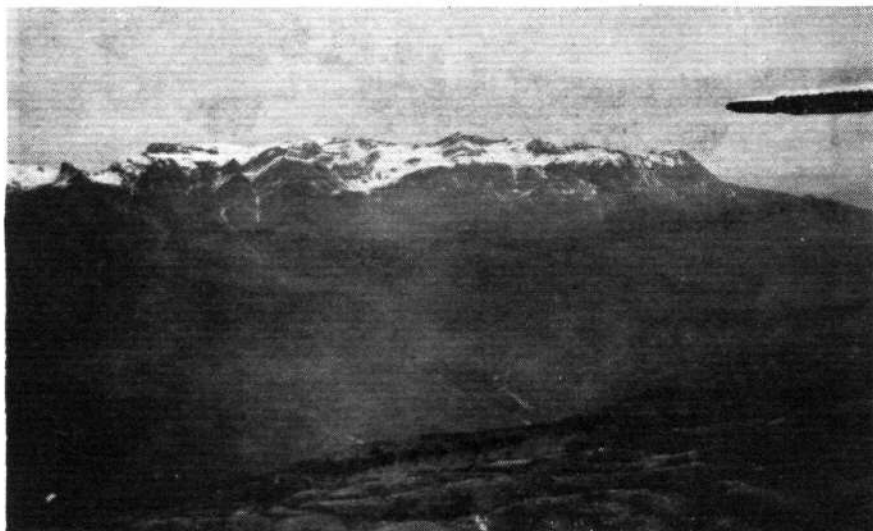
The daily service to Salonica has been run since June 1, 1931, and to Jannina via Agrinion 3 times a week since November 23. These services have been maintained regularly except during bad weather, and no fatal accident whatsoever or injury to passengers or aircraft has been sustained. The current services are as follows:—Athens-Salonica; daily service in each direction except Sundays (2 hr.), 370 km. Athens-Jannina; service operated 3 times a week via Agrinion (2½ hr.), 370 km.

The following statistics cover the period of operation from June to December, 1931:—Kilometres covered, 131,074; No. of passengers, 3,058; luggage in kg., 21,558; mail in kg., 4,337; freight in kg., 9,061.

On the basis of an agreement existing between E.E.E.S. and other air lines operating through Greek territory (K.L.M., Air Orient, Imperial Airways, etc., etc.) Greek mail and passengers are given facilities for rapid communication with many distant places in the East.

Connections with other air lines are made at Athens with Brindisi, Istanbul, and Belgrade, etc.

E.E.E.S. are supplied exclusively with Shell Aviation spirit and Aero Shell oil.



ON THE ATHENS-JANNINA ROUTE: Top, the Tsumerka Mountain of the Pindus range (7,800 ft.). Below, approaching Jannina, with Ali Pasha's Island in the background.



FOR THE AFRICAN AIR ROUTE : The Armstrong-Whitworth "Atalanta" (four Armstrong-Siddeley "Double Mongoose") is the first of eight machines being built for Imperial Airways, Ltd. The extremely careful streamlining should be noted. (FLIGHT Photos.)



A NEW VERSION OF THE JUNKERS G.38: The "D 2500" which has just been put into service on the Berlin-London route by Luft Hansa. It has accommodation for 34 persons.

THE NEW JUNKERS G.38 "D.2500"

IT will be remembered that in the summer of 1931 the German Luft Hansa put into service on the Berlin-Amsterdam-London route the large Junkers G.38 "D 2000" monoplane. We understand that the results obtained with this machine were entirely satisfactory, both from the technical point of view and as regards economical traffic operation. A second machine of similar type, but with certain modifications resulting from the experience gained with the first machine, was therefore constructed, and this—the "D 2500"—has recently been put into service on the same route.

The original G.38 was designed for freight and passenger transport for day and night traffic on long-distance inter-continental routes, special consideration being given to economical operation, range, large passenger, freight and mail carrying capacities, and at the same time safety and comfort for the passengers.

Since the construction of the G.38 some four years ago, the political and financial situation in Germany somewhat interfered with the original plans and developments of this machine, and certain modifications in the original design as regards the carrying capacity were considered advisable. In actual operation, however, it was found that not only the freight business, but the demand for passenger accommodation exceeded expectations—hence the second enlarged machine.

In the "D 2500," therefore, the seating capacity was increased by slightly raising the fuselage top extending over the wing, and by lengthening the main passenger

cabin rearwards. A more rational utilisation of the cabin space generally also made for improvement. Thus, there is now accommodation for 34 persons, disposed as follow:—25 seats in the wing-fuselage cabins, six seats in the leading edge viewing rooms and two in the nose, the crew consists of seven. It will be seen from the accompanying illustration that excellent views are obtained from the cabins.

The raising of the cabins has provided extra freight space "between decks," which has been utilised to advantage.

In front of the main passenger cabins in the centre section, just behind the engineers' and pilots' cabins, there is a kitchen with pantry, and a lavatory close by; a second lavatory and a smoking room is located at the rear of the passenger cabin.

All four engines are now Junkers L.88 type, giving a total h.p. of 2,600 as against the previous 2,200, and increasing the cruising speed to 185 k.p.h. Although this increase of power has also increased the total loaded weight from 21,200 kg. to 24,000 kg., the useful payload has been increased by about 20 per cent.

Another improvement in the "D 2500" is the provision of the Junkers patent adjustable wing flaps, which has considerably improved the performance of the machine, especially as regards landing speed. The general equipment and fitting out of the "D 2500" has also been improved in many respects.

This machine paid its first visit to Croydon on June 27.



Reinforcing Iraq by Air

THE Assyrian levies who are used as aerodrome guards in Iraq have become dissatisfied with their position and prospects and have threatened to desert. The cause for dissatisfaction seems reasonable enough, as their numbers were to be progressively reduced until they were all replaced by special aerodrome guards. In the circumstances the High Commissioner for Iraq asked for a battalion of British troops to be held in readiness for despatch if necessary. The 1st Battalion Northamptonshire Regiment was ordered to stand by in Cairo. Finally it was decided to send four companies of the battalion (some 600 men) by air to Iraq, and it was arranged that they should leave in R.A.F. "Victorias" on the morning of Wednesday, June 22. It was reported that 10 machines would be used,

and presumably they are those of No. 216 (Bomber Transport) Squadron.

Director of Aviation in Egypt

WING COM. SIR CHRISTOPHER J. Q. BRAND, K.B.E., D.S.O., M.C., D.F.C., who was the companion of Sir Pierre Van Rynefeld on the first flight from England to South Africa, and who is now stationed at the R.A.F. Depot at Aboukir, has been appointed Director of Aviation (both military and civil) in Egypt. His staff officer will be Sqd. Ldr. V. H. Tait, who is at present on the staff of the Middle East Command. Air Commodore Board was recently appointed Director of the Egyptian Air Service, but resigned that position in connection with the despatch of "Moths" from England to Egypt. The two branches of flying will now be combined under one directorate.

AIRPORT NEWS

THE PROVISION OF AERODROMES AND THE SAFEGUARDING OF THEIR SITES

THE provision of adequate aerodrome facilities to meet the development of civil aviation in this country and the safeguarding of aerodrome sites has for some time occupied the attention of the Standing Committee of the Civil Aviation Section of the London Chamber of Commerce.

A memorandum on the subject was recently submitted to the Secretary of State for Air urging that steps should be taken to deal with the position, particularly in connection with the safeguarding of aerodromes from obstructions on adjoining property.

The views of the Section, which have also been communicated to the Minister of Health, are supported by the following organisations:—The Royal Aero Club of the United Kingdom, the Society of British Aircraft Constructors, Ltd., the Guild of Air Pilots and Air Navigators of the British Empire, the Automobile Association and the British Aviation Insurance Co., Ltd.

The Section is of the opinion that the subject dealt with in the memorandum is one of national importance requiring the urgent attention of the authorities.

The text of the memorandum is as follows:—

The development of commercial air transport and amateur flying in Great Britain has reached a stage when the problem of providing adequate ground organisation becomes a matter of primary importance requiring the urgent consideration of the responsible authorities. Two important aspects of this problem are: (a) the provision of adequate air port facilities and (b) the rendering of these air ports safe for the public, which includes both public safety in the air and on the ground.

Under the Air Navigation Act, 1920, local authorities were empowered to borrow money required for the purchase of land for an aerodrome upon the security of the rates, whilst under the Public Works (Facilities) Act, 1930, they may acquire land compulsorily for general purposes, including the provision of aerodromes, where the Ministry of Health is satisfied that the work will contribute to the relief of unemployment. Nevertheless, the fact remains that the majority of aerodromes are privately owned and operated, and comparatively few local authorities have taken any definite steps to provide them.

The Under-Secretary of State for Air, when introducing the Air Estimates this year, pointed out that it was very desirable that greater progress should be made in the provision, or at any rate the reservation, of sites for Municipal Aerodromes. It must, therefore, be hoped that, even if the financial position in many cases prevents local authorities from constructing their air port, they will without delay take the precaution of securing a suitable site for future development. In this connection, it may be asked whether assistance should not be given on strict conditions, in the general public interest, for the establishment of air ports by private owners instead of confining such assistance to local authorities who may or may not be willing to undertake the work.

It is appreciated that, before a site for a Municipal Aerodrome is officially approved, care is taken to ensure that the site selected is within as short a distance as possible from the centre of the town, is suitable for technical reasons and capable of extension if necessary. It may then, after being approved, be considered to be the best site available for a reasonable expenditure of money on the purchase and development of the land.

Among the features to be considered in examining a site are the objects within a mile which are higher than one-fifteenth part of their distance from the perimeter of the site and which, if occupying too much of the air space

required by approaching and departing aircraft, would render the aerodrome unsafe and prevent it being licensed.

The owner of a licensed aerodrome is restricted by the terms of his licence in the works that he may carry out or in the buildings he may erect on the site. If he makes any alterations or additions without the approval of the Air Ministry, the licence may be withdrawn. The owner of an aerodrome, however, has no powers to prevent the owners of adjoining property from erecting works or buildings within a mile of the aerodrome and higher than a horizontal equivalent of 1 in 15.

A municipality may have spent considerable sums on the purchase and development of a site admirably situated to serve the needs of the town. Further sums may have been spent on elaborate equipment, hangars, workshops, offices, &c. If, however, sufficient land surrounding the aerodrome has not been purchased by the municipality, the owner of adjoining property may erect obstacles that make the aerodrome unsafe for use by aircraft. The licence may be cancelled, the municipality may lose thousands of pounds and an excellent aerodrome position be lost for ever. Commercially owned aerodromes are exposed to the same danger, and this may prove a deterrent to the establishment of new aerodromes as people would obviously be ill-advised to contemplate sinking large capital sums in the provision of aerodromes unless this danger were first removed.

The purchase of sufficient ground round an aerodrome site to render it safe from the danger of obstructions subsequently erected would make the initial cost of acquiring land uneconomical. The use of all this land would not be required, but merely the air above it.

Legislation is, therefore, required to prevent obstructions such as factories, chimneys, &c., being raised within the prescribed distance unless limited in height. Provision could be made for compensation to adjoining owners who were injuriously affected and such compensation might for example be assessed under the Land Clauses (Consolidation) Act. These provisions would apply both to public and private undertakings.

Where the owner of an aerodrome or the promoter of a proposed aerodrome wished to take advantage of these provisions, he would make application to the Air Ministry. The applicant would be required to publish his request and individuals would be given the opportunity of lodging such objections as they might entertain and a public inquiry might be held. In the event of the application being granted, restrictions could be imposed according to the category in which the aerodrome might be classified. Alternatively, the present Air Ministry requirements for an aerodrome licence might form the restrictions. Within a mile of an aerodrome any object that is higher than a fifteenth part of its distance from the perimeter of the aerodrome would be regarded as an obstacle. The erection of obstacles within a mile of the aerodrome would be prohibited. The extent to which such a prohibition would adversely affect the interests of owners of surrounding property would not be excessive since at a distance of 200 yards from the edge of the landing area a building 40 ft. high would be permissible. It would appear to be unnecessary to carry the restrictions to a distance of more than a mile from the aerodrome, since at 1,760 yards a building 352 ft. high would be allowed.

By dealing with the matter in the way proposed, the owners of all adjoining land would be adequately protected, and the development of aerodromes—a matter of great national importance—would be assisted. Until these or some similar provisions are made, aerodrome development will be retarded.

Unless some definite scheme is adopted, the provision of sufficient air ports around large towns will shortly become a matter of so great an expense as to render it impracticable, or aerodrome proprietors may be subjected to a form of pressure by adjoining owners who by the erection of obstructions can at present virtually compel the withdrawal of the Air Ministry Aerodrome licence.

The proposal now made is not novel in that it has already been adopted in some form or another by several Continental countries, e.g., France, Italy, Holland and Poland, and, unless she takes similar measures, England may in time be placed in a position of inferiority to these countries in air matters. The growth of the railways in this country, the establishment of the arterial roads, housing, town planning and hydro electric schemes, to supply only a few instances, have all involved invasion of property rights in the interest of the public, and it is on these analogies that the case rests for developing and safeguarding the air ports of the future.

CROYDON

LAST week has been just one long rush—hordes of passengers and tons of freight arriving or departing daily. Quite a number of passengers are *en route* for holidays abroad and a larger number still are sent on rapid transit to or from their businesses. One can easily discern the latter type of passenger—he or she just casually strolls out to the aircraft, takes a seat, and usually commences to read. The holiday type just gape about, ask many questions, and almost run to the aircraft in their keen endeavour to secure what they think is the best seat on the machine. And you and I just smile at the seat they have selected. The stolid railway passenger who always secures the “starboard side back to engine” seat certainly does not back a winner on aircraft!

The airport itself is daily becoming like a youthful Euston, Paddington, etc. The various companies' staffs are all most obliging and can certainly teach some of the railway termini staffs how to load and despatch an outgoing aircraft or unload and overhaul an incoming one. The uniforms of the different national companies add a touch of colour—the decision to uniform the ground staff was a good one. It only remains for the aerodrome officers in the Control Tower to be arrayed as ships' officers to complete a splendid set of uniforms. The aerodrome officers are in every way like unto permanent ships' officers and should be dressed as such. Maj. Richard, the chief aerodrome officer, would make an ideal Commodore.

Numbers of machines are being tuned up in readiness

for the King's Cup Race which this year commences and finishes at Brooklands. The Percival “Gull” looks a smart machine—built, I should imagine, on the lines of the “Hendy 302.” The Monospar, with Flt. Lt. Schofield, has been very busy of late. It would not be fair to give away any figures, but I am given to understand that Croydon will be very well represented in the race.

The Imperial Airways liner *Heracles* is still reposing beneath the trees at Hanworth Air Park—and rumour hath it that he is likely to stay there for at least another month. The provision of spares seem the cause of the bother in connection with the little upset which occurred last week.

The new radio beacon is still undergoing tests and it is understood that Marconi & Co. are almost ready to hand over to the Air Ministry for their official tests.

Luft Hansa are now operating their new Junkers G.38 between Berlin and Croydon. She gave several demonstration flights on Tuesday. Maj. Mealing, of the Department of Civil Aviation, Air Ministry, was one of the specially invited guests to fly over London. Some of the passengers remarked how much they had enjoyed their “roof-top” flight. She has a good take off and is now a double decker.

The Atalanta type from Messrs. Armstrong Whitworth is still awaited. I understand that “Tich” Attwood will be coming home shortly to accustom himself to these

machines. They will, of course, be used on the sector Cape Town-Johannesburg, of which Tich is chief pilot. He will be relieved by Capt. Dudley Travers. Quite a number of Imperial pilots have recently been home on leave, and one wonders when people like Prendergast and Egglesfield will be home. They must have had a rather gruelling time on the equatorial stretch of the Cape-Cairo route.

The new boundary marking lights have been fitted with

a surrounding wooden base painted white with a red horizontal stripe, easily distinguishable both by day or night.

A continuous rush of "B" licence applicants for night tests is keeping the local instructional firms busy.

Figures for the week: Passengers, 1,908; freight, 74 tons.

P. B.

FROM HESTON

MONDAY, June 20.—Banco sent a "Puss Moth" off to Berck at 6 a.m. to collect two passengers, returning to Heston at 10 a.m. after having landed the passengers at Croydon.

Hillman's "Puss Moth" left for Baldonnel at 8 a.m., returning to Heston at 8.30 p.m. with pictures of the Eucharistic Congress, while Mr. Brian Russell, piloting the Hendy 302 of Personal Flying Services, Ltd., made the quick time of 2 hr. 32 min. from Finglas to Heston, for the same purpose.

Miss Lippens departed for Brussels on her "Puss Moth" OO-AMN, and Maj. Nathan on his "Moth" for Paris.

The Earl of Essex successfully accomplished his first solo flight late on Sunday evening.

Tuesday.—Capt. W. Ledlie, of Personal Flying Services, Ltd., left Heston for Dublin in a "Junkers," and Dr. Thierry for the same destination in a "Moth."

Mr. Jones, with two passengers, returned from Paris in the "Puss Moth" which he is flying back to India on termination of his leave.

Maj. Nathan returned from Paris in his "Moth."

Wednesday.—From the first booking at 10 a.m. until dusk Airwork School of Flying had not a vacant moment, and several pupils were able to put in solo time towards their "A" licence.

Capt. G. W. E. Heath qualified for his "A" licence.

The Misr-Airwork Flying School, Heliopolis Aerodrome, Cairo, an associated company of Airwork, Ltd., Heston, is now in full operation, and report a full booking for the first seven days' flying. The aerodrome is fully equipped and a map hire service is available from Cairo to Heston while, as at Heston, a complete stock of flying equipment is on sale.

Thursday.—Three of the Airwork School of Flying pupils qualified for their "A" licences to-day, viz., Mr. and Mrs. S. Pakenham and Sir Alfred Beit, Bart.

Friday.—To-day General Balbo, Italian Air Minister, arrived at Heston on a "Breda 32," all-metal machine, fitted with three Pratt Whitney "Wasp" engines. He had flown the machine from Rome, landing at Geneva and St. Quentin on the way for refuelling. Accompanying him were Col. Martelli, Maj. Liberati, Maj. Baudoin, Com. Donati, all of the Italian Air Ministry, also a wireless operator and a mechanic. As General Balbo stepped from the machine the Airport flag was lowered and the Italian flag hoisted to the mast-head. The following were present to receive the General:—Senor Mamoli, Italian Charge d'Affaires; Col. Bitossi, Italian Air Attaché; Air Commodore H. Le Marchant Brock, representing the British Air Ministry; and Mr. Nigel Norman and Mr. R. P. G.



Amalgamation of Aviation Classification Interests

As from July 1, 1932, the Aviation Committees of Lloyd's Register of Shipping and the British Corporation Register of Shipping & Aircraft will act jointly. Our readers will be well aware that during the past three years the inspection and work connected with the renewal of Certificates of Airworthiness for light civilian aircraft has to a very large extent been delegated by the Air Ministry to these two bodies. It is now felt that it will be an advantage to all aviation interests if the activities of these two societies in aircraft classification should be united, and it is hoped that in time the classification of civilian aircraft will be organised on lines similar to those which have proved so successful when applied to shipping. The office of the new body is situated at 71, Fenchurch Street, London, E.C.3, and the very strong joint committee, which is fully representative of every branch of civilian aviation, will consist of the following:—

SIR GEORGE HIGGINS, Chairman, Lloyd's Register of Shipping (*ex-officio*). ROBERT CLARK, Chairman, British Corporation Register of Shipping and Aircraft (*ex-officio*). ARTHUR L. STURGE, Chairman. MAURICE E. DENNY, Deputy-Chairman. H. BURROUGHS, Director, Gloster Aircraft Co., Ltd. (Deputy-Chairman S.B.A.C.). SIR ALAN J. COBBAM, Chairman, Alan

Denman, of Airwork, Ltd. General Balbo attended the R.A.F. Pageant at Hendon and the S.B.A.C. show on Monday, returning to Italy on June 28.

The Marquess of Donegall made his first solo flight to-day.

Miss Bronwen Scott-Ellis, daughter of Lady Howard de Walden, qualified for her "A" licence.

An ambulance plane of Imperial Airways arrived at Heston to-day from Le Touquet, piloted by Capt. Olley, with Lord Dudley, who is suffering from an internal complaint. Lord Dudley was accompanied by Lord Ednam and a doctor and nurse.

Airwork School of Flying is still obtaining new pupils, two commencing instruction to-day.

Saturday.—Two of the visitors to Heston to-day were Dr. P. Behague, head of the Aviation branch of the Touring Club of France, and Mr. W. A. M. Westerouen van Mesteren, who holds a similar position in the Touring Club of Holland. They were accompanied by Mr. Ivor McClure, of the Automobile Association Aviation Department. Both these gentlemen expressed their pleasure at the general layout and organisation of Heston, in particular the system of holding A.A. flying maps covering practically the whole of Europe for hire to members and facilities for immediate issue of "Carnets" for travel abroad.

Hillman's two "Puss Moths" left for Dublin at 6.30 a.m.

Many private owners flew to Heston and thence by road to Hendon to attend the R.A.F. Pageant, also two machines from Brussels, three from St. Engelvert and one from Antwerp.

Sunday.—Most of our friends from France who had flown over to attend the R.A.F. Pageant left to-day for the return journey.

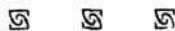
General Balbo, the Italian Air Minister, visited Heston to-day with many members of the Italian Embassy and the Italian Colony in London, and was much interested in the capabilities of the Comper "Swift" as demonstrated by Flt. Lt. R. Bentley, of Shell Mex-B.P.

Lady Howard de Walden arrived with three of her daughters, she herself and Miss Priscilla Scott Ellis having lessons and the two younger daughters enjoying long joy rides in the family aeroplane.

Visitors have been very numerous to-day, and Airwork School of Flying could easily have employed double the number of aeroplanes available, they being quite unable to cope with the requirements.

Capt. Ledlie, of Personal Flying Services, Ltd., arrived from Dublin in their "Junkers" and reported enormous business at the new Finglas aerodrome with joy rides.

Lord and Lady Waleran both had flying lessons to-day.



Cobham Aviation, Ltd. LI.-COL. M. ORMONDE DARBY, Chairman, Adastral General Finance Co., Ltd. M. EVANS, Director, British Aviation Insurance Co., Ltd., and Member of the Committee of Lloyd's. I. C. GEDDES, Director of the Managers of the Orient Steam Navigation Co. L. GLEN, Chairman, Glen & Co. J. H. GLOVER, Chairman of the Sub-Committees of Classification, Lloyd's Register of Shipping. P. HARGREAVES, Underwriting Member of Lloyd's. MAJ. R. G. HEYN, Chairman, G. Heyn & Sons, Ltd. Air Marshal SIR JOHN F. A. HIGGINS, Chairman, Sir W. G. Armstrong, Whitworth Aircraft, Ltd. E. R. H. HILL, Underwriting Member of Lloyd's. G. J. INNES, Director, P. Henderson & Co. Capt. A. G. LAMPLUGH, Underwriter, British Aviation Insurance Co., Ltd. B. LEWIS, Managing Director, Brian Lewis & Co., Ltd. MAJ. I. H. MCCLURE, The Automobile Association, Ltd. G. MACKINNON, Underwriting Member of Lloyd's. SIR ROBERT MCLEAN, Chairman, Vickers (Aviation), Ltd. Lt.-Col. J. T. C. MOORE-BRABAZON, Vice-President, R.Ae.S. H. N. ST. V. NORMAN, Chairman, Airwork, Ltd. F. HANDLEY PAGE, Managing Director of Handley Page, Ltd. HAROLD E. PERRIN, Secretary, R.Ae.C. Lt.-Col. C. E. C. RABAGLIATI, Underwriting Member of Lloyd's. W. L. RUNCIMAN, Director, The Cramlington Aircraft Co., Ltd. SIR PHILIP SASOON, MAJ. F. P. SCOTT, General Manager, A. V. Roe & Co., Ltd. Col. THE MASTER OF SEMPILL. H. G. SIMMS, Director, British Aviation Insurance Co., Ltd. W. S. STEPHENSON, Director, National Flying Services, Ltd. H. J. THOMAS, Director, Bristol Aeroplane Co., Ltd. (Deputy-Chairman S.B.A.C.). Air Vice-Marshal SIR VYVYAN Director, Imperial Airways, Ltd. C. C. WALKER, Director, De Havilland Aircraft Company. Air Comm. J. G. WEIR, Director, G. & J. Weir, Ltd. G. E. WOODS-HUMPHERY, Managing Director, Imperial Airways, Ltd. SIR ARTHUR WORLEY, Managing Director, North British and Mercantile Insurance Co., Ltd., and Chairman, British Aviation Insurance Co., Ltd.

Consultant will be Maj. R. H. MAYO. Surveyors: L. J. HILL (Principal), W. E. PACKMAN, G. H. M. MILES, J. NORMAN, G. H. POWELL, F. W. AUSTIN, Joint Secretaries: M. K. SCOTT, T. R. THOMAS.

AIRISMS FROM THE FOUR WINDS

Capt. Stack in India

CAPT. NEVILLE STACK, who left Heston on June 17 on a flight to India in the Spartan Mailplane (three "Gipsy III" engines), reached Karachi on June 23. He met with several delays *en route*.

Italian Seaplane Returns from Iceland

THE Italian Savoia flying-boat which, as reported last week, flew from Italy to Iceland, in connection with the forthcoming formation flight across the Atlantic by the Italian squadron under Gen. Balbo, flew from Reykjavik to Londonderry on June 26 *en route* for home. Continuing its flight next day it made a forced landing in Southampton Water, but the machine was undamaged and the crew unhurt.

A World Tour Completed

THE two American airmen Richard Hailburton and Moya Stephens, who left Los Angeles on December 25, 1930, with their Stearman Mailplane *Flying Carpet* on a world tour—references to which have already appeared in FLIGHT—returned home to San Francisco early this month. During their tour they have covered some 50,000 miles over most of the world's out of the way places in the Near East, India, the Malay Straits, the South Seas, Borneo and the Philippines.

More Honours for Miss Earhart

PRESIDENT HOOVER, it is reported, has awarded Miss Amelia Earhart (Mrs. Putnam) the Distinguished Service Cross in recognition of her solo Atlantic flight. She has also been presented with the medal of the National Geographical Society.

Italy's Gift Aeroplane to Hungary

THE Italian Government has sent to Bucharest an aeroplane named *Justice for Hungary* as a gift to replace the machine of the same name destroyed when Capt. Endresz crashed when landing in Rome recently.

Offensive Air Armaments

The *Times* correspondent recently sent the following report from Geneva:—

The Air Committee of the Disarmament Conference to-day adopted the main conclusions of its draft report to the General Committee in reply to the three questions as to what armaments are (a) most specifically offensive, (b) most effective against national defence and (c) most threatening to civilians.

The report says in answer to the first question that the offensive character of aircraft varies on account of the wide differences in the geographical positions of different countries, the situation of their vital centres, and the state of their anti-aircraft defences, and that any qualitative question in connection with air armaments is closely bound up with quantitative considerations. Nevertheless, the committee found it possible to set down certain general conclusions.

In these they state that all air armaments can be used to some extent for offensive purposes, but that their capacity for offensive action depends on certain constructional characteristics. Considering these characteristics from the point of view of national defence it finds those armaments most effective which are capable of dropping or launching means of warfare of any kind, that their efficacy

depends on the useful load, and that this is determined by a large number of various factors. Among those factors are the weight unloaded, horse-power and wing area for aeroplanes, and volume and horse-power for airships.

In this connection the report records that 18 States, including Great Britain, France, and the United States, considered that unloaded weight alone was an adequate criterion, while 19 held that this was inadequate and that horse-power and wing area should also be considered.

With regard to the threat to civil populations, this is held to depend primarily on the means of warfare employed and the manner in which they are employed, the most threatening means being those which, considered individually, produce the most extended action and the greatest moral or material effect. Among these are mentioned poisonous gases, bacteria and incendiary and explosive appliances.

American Disarmament Proposals

At the Disarmament Conference at Geneva on June 22 Mr. Gibson, the U.S.A. delegate, made public some proposals of President Hoover for Disarmament. These included the abolition of all tanks, all chemical warfare, and all large-calibre guns, the reduction of military effectives, the abolition of all bombing aeroplanes and the prohibition of all bombardment from the air, as well as reductions in the number and size of warships. Sir John Simon, speaking before the proposals had been studied in detail, remarked that aeroplanes not primarily intended for bombing could be used for that purpose. He added that Great Britain was in favour of the total abolition of submarines.

Hermes Service during the King's Cup Race

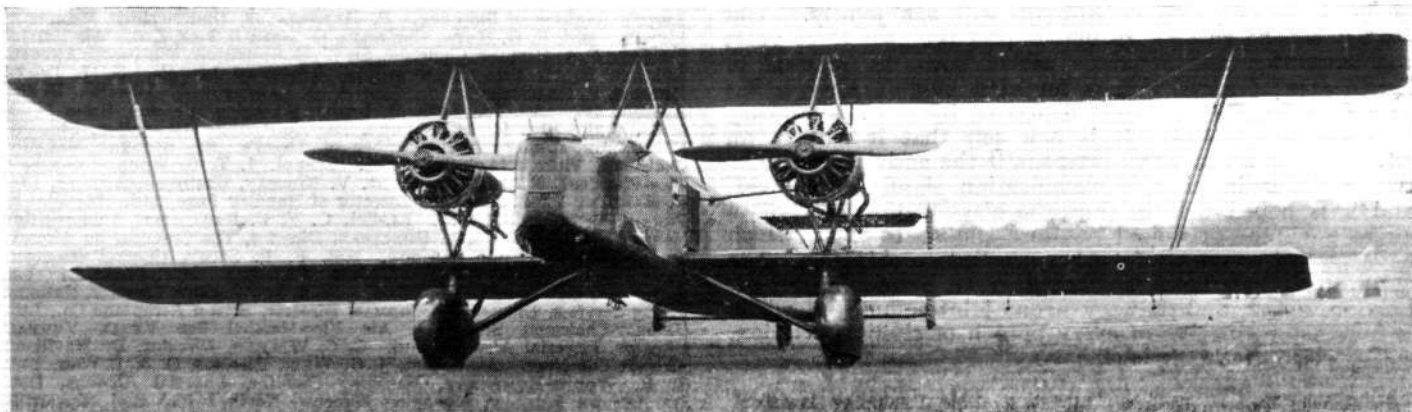
EXTENSIVE arrangements have been made by the Cirrus-Hermes Engineering Co. for servicing their aircraft engines which are being used by competitors in the forthcoming King's Cup Race. On Thursday evening and all Friday (July 7 and 8) four mechanics will be at Brooklands Aerodrome. On Friday two will be at Leicester and two at Bristol, and on the Saturday six mechanics will be available at Brooklands. All these mechanics will be noticeable by their white overall "Cirrus Service" uniform, and users of Cirrus-Hermes engines are requested to make full use of their services.

National Aviation Day Displays

DISPLAYS in connection with Sir Alan Cobham's National Aviation Day Campaign will be held as follows:— July 2 and 3, Newcastle, Cramlington Aerodrome. July 4, West Hartlepool, The Old Seaton Aerodrome. July 5, Middlesbrough, The Flying Field, Cargo Fleet Lane. July 6, Bridlington, East Leys Farm. July 7, Scarborough, The Old Racecourse. July 8 and 9, Sheffield, Coal Aston Aerodrome. July 10, Barnsley, The Old Wombwell Aerodrome. July 11, Goole, The Old Racecourse. July 12, Skegness, The Aerodrome. July 13, Kettering, The Flying Ground. July 14, Leicester, Desford Aerodrome. July 15, Leamington, The Flying Field, Cubbington Road.

New Gloster London Office

WILL readers please note that the Gloster Aircraft Co., Ltd., of Hucclecote, Glos, have moved their London office from Byron House, St. James Street, to 5, Grafton Street, Bond Street, W.1. Telephone: Regent 7355-6.



A NEW VICKERS NIGHT BOMBER: Fitted with two Bristol "Pegasus" engines, this machine is a four-seater of 1,367 sq. ft. wing area and a gross weight of 16,400 lb.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

ENGINE MOUNTING STRESSES

[2794] I have read with interest in the issue of FLIGHT for May 27 the article on engine mounting stresses by R. Rodger.

I should be glad if he would be good enough to explain why in Fig. 10 (plan view) he shows an aft force at A and a due to gravity. If the engine mounting is stressed in the position shown it would appear that the sum of the fore and aft loads should be zero. A total aft force of 1,350 lb. is indicated on the diagrams.

Again, although one might conceivably get an aft component of the thrust at B (side elevation) in the present instance, it is not quite clear why this should be so, and I should be interested in knowing why the author has placed the load in this direction.

Yours faithfully,

J. F. Cuss.

Norwich.

May 28, 1932.

[We have submitted the query to Mr. Rodger, who sends the following reply.—ED.] :—

The case depicted in Fig. 10 is as stated beneath the diagram, i.e., Case I—Port turn—R.H.T. Referring to Fig. 4, the stressing condition is stalled aircraft with engine on. In Fig. 10 the thrust line is shown horizontal for convenience, and the line of action of the gravity forces is, therefore, inclined backwards. Actually, of course, the thrust line is inclined upwards by the nose, and the gravity forces act vertically downwards. The results are, however, the same, and the gravity forces may be resolved into rectilinear components parallel to and normal to the plane BAC (side elevation).

The parallel component is, in the case illustrated, 6950, divided equally between A and a in front elevation, and the normal component is 1350, divided equally between A and a in plan.

The thrust acting forwards is 1410, divided equally between A and a in plan. The thrust is also offset below nodes A, a by an amount 2_4 (see Fig. 7). There is, therefore, a clockwise couple T_2 , which is balanced by a forward reaction at B and an aft reaction at C of equal magnitude, say R. The balancing couple is then R_2 . The external forces applied to the structure are then a push at B and an equal pull at C.

I trust this explanation will help your reader.

R. RODGER.

Southampton.

June 2, 1932.

WOOD—THE SHOCK-ABSORBER !

[2795] In endorsement of your recent leading article on *Wooden versus All-metal Construction*, may I bring forward yet another argument in favour of the older system?

A short time ago I was talking to the repair-shop foreman of one of our leading civil aviation firms. We were standing close to a slightly-damaged metal light aeroplane, and the conversation veered round to the good and bad points of metal construction. The foreman's opinion can best be seen from a quotation of his actual words: "The trouble with these metal craft is, that if they do get a bit of a biff the damage you can see isn't all the damage by a long chalk. With a wooden machine, if you make a bum landing you break a longeron, say, and that's the end of it. With a metal machine you may bend a main member and wrench a fitting or two where you hit, but the shock travels all over the frame and as likely as not you'll find parts have been strained up in the tail or out on the wings even though it was only an engine bearer that seemed to be unserviceable at the first go-off." Here, then, is a very real and fundamental advantage of wooden aircraft, more especially to owner pilots of moderate means (may their tribe increase), who cannot, perhaps, face the cost of returning their machine to the makers after every minor mishap. None the less, they might be

tempted, after the visible damage to a metal machine had been made good, to go on flying an aircraft that had been badly strained in some quite unexpected component—to the danger of their own necks as well as the good name of private flying!

DAVID H. M. SYMON.

Chorley Wood, Herts.
May 23, 1932.

BRITISH AIRCRAFT IN SOUTH AMERICA

[2796] May I take the opportunity of bringing to the notice of British aircraft manufacturers, through the medium of your columns, the fact that, during 13 years that I have lived on one of the main railway lines of the Argentine Republic I have only twice seen British aircraft in flight over this district. The first occasion was in 1920, and the machine was an "old A.W." with a R.A.F. engine. The second occasion was that of the British Exhibition in this country, after the opening of which H.R.H. the Prince of Wales flew over on a visit to an Estancia in this vicinity.

I do not mean to infer that I have seen many foreign aircraft in flight over here, but I have seen foreign aeroplanes on eight different occasions, and I do not consider 20 per cent. British is good enough.

Recently I wrote to a business man in Buenos Aires proposing certain transactions in connection with the importation of British aircraft to this country. His reply was that there was not a flying club out here that had "a bean to bless itself with," and also that the Argentines were not yet airminded. I do not know of the truth of the first statement, but I know the latter statement to be perfectly true, and, surely, this fact is the one to work on. Let us get them airminded on British machines. I know that there are British aeroplanes in this country, but we never see them over here. There are also agents for British aeroplanes; they never advertise or demonstrate, or, if they do, they have not yet reached this part of the country—3 hours from Buenos Aires by air.

I know at least one other ex-R.A.F. war pilot who, like myself, would be perfectly willing to demonstrate an English aeroplane and take up a certain number of passengers at our own expense, but the present rate of exchange forbids the purchase of an aeroplane unless manufacturers were willing to meet us half way.

The greater part of this country is one vast aerodrome, and there is no doubt that there is an immense future for the aeroplane here; and one feels that, if British manufacturers do not wake up immediately, they will lose the market. There are large firms of auctioneers here who have to run over the whole country—in trains, if you please! Surely this is an absurd state of affairs. If the auctioneer had an aeroplane he could hold an auction of cattle in Tucuman on one day and another one on the following day in Bahia Blanca, and the only way to persuade him of this is to take him and do it.

I made up my mind years ago that as soon as I could afford to purchase a British aeroplane I would do so, and, when this happy event takes place I will undertake to take up as many passengers at my own expense as possible. Meanwhile, I consider that it is up to British manufacturers to send out demonstration machines in capable hands (no good stunting about on them, straight flying and gentle turns, and slow landing speeds are necessary), and, although in these times of financial difficulties a certain amount of courage is needed to take such action, they would never regret having done so.

Personally, I feel very strongly that I would like to transmit to the Argentine people the faith I already have in the British aeroplane—before some quicker-minded foreigner "sticks" them with inferior goods.

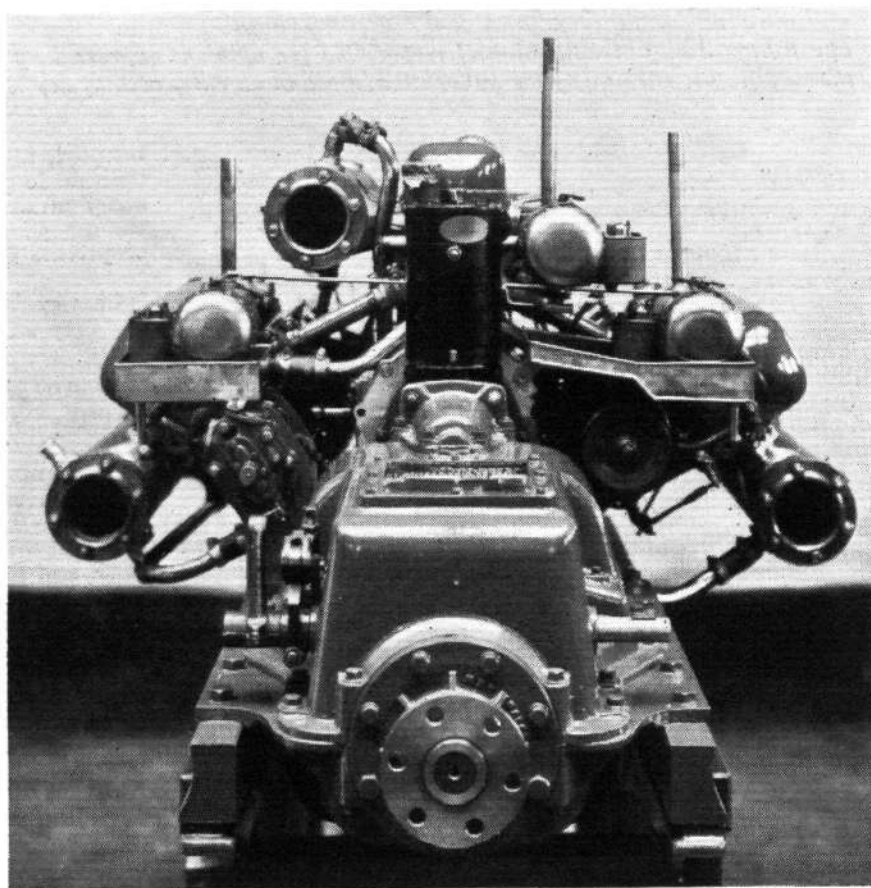
"ALAS PLEGADAS."

Argentine,
April 25, 1932.

Napier "Lions" for Motor-Boats

A 500-h.p. engine with obvious potentialities for high-speed motor-boat work is the result of converting a Napier "Lion" aero engine. This development has been undertaken by Mr. H. Scott Paine, of the British Power Boat Co., of Hythe, Southampton, and the marine conversion is known as the "Power" "Sea Lion." It is the most powerful motor-boat engine produced on this side of the Atlantic. It is expected to accomplish 300 hr. without overhaul, and the alterations have resulted in an engine of much smaller dimensions than any known marine type which approaches the "Lion's" horse-power. A long series of experiments have preceded this achievement, which gives promise of the development of high-speed motor-boats for sporting purposes, and of boats for commercial work with moderate speed and high power. The size of the "Sea Lion" will also enable it to be installed in very small boats for racing, for its greatest length is 6 ft. 3 in., overall width 3 ft. 6 in., and height 2 ft. 10 in. As preparations have been made to convert a large number of "Lion" engines, it should be possible to market them at a price much lower than that of a new "Lion" aero engine, while the marine version will also be rather more economical than the aero type. During bench tests, when developing 518 h.p., its petrol consumption was 35 gallons per hr. The power-weight ratio is approximately 2.6 lb. per h.p. developed, and at 2,300 r.p.m. the engine yields 500 h.p. Arrangements have been decided upon for the production of the "Sea Lion" at three different ratings, the lower two being 400 and 425 h.p. respectively. There will thus be a change in compression ratios, with longer life. A great advantage over engines primarily designed for marine work is gained by the "Sea Lion" in its low power-weight ratio, while the design of its cylinder banks in the form of a broad arrow produces a very compact engine.

Among the alterations carried out is a clever arrangement of the manifolds for the main water cooling and the removal of a mass of water pipes from the cooling system, which contributes to the neatness of the marine engine. The cooling system employed results in fresh water being led into the manifolds through honeycomb tubes. When

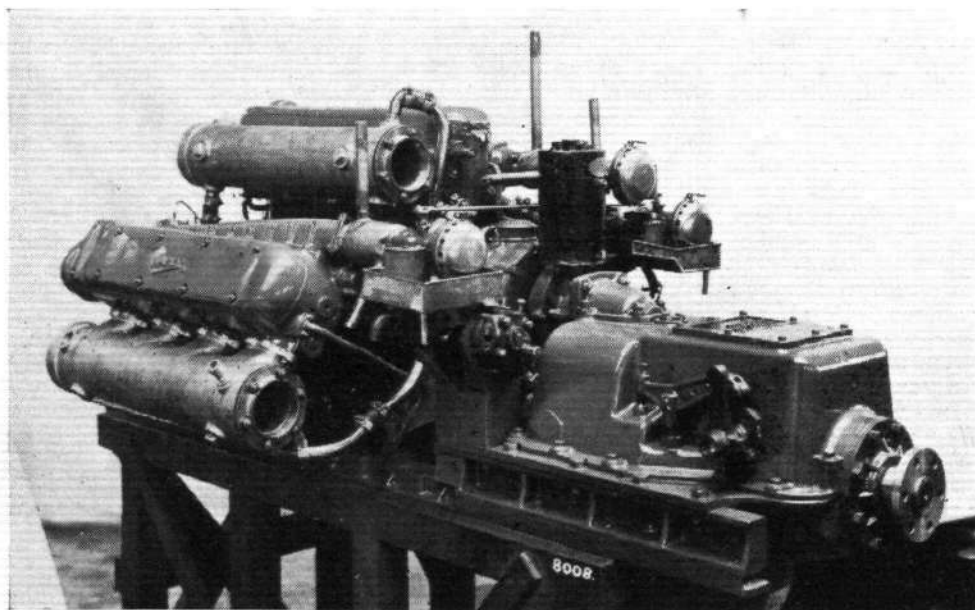


An end view of the "Sea Lion." The way in which this conversion for marine use has been carried out makes it an extremely compact engine for its power.

the boat is moving salt water is drawn into the manifolds by means of an inlet and suction outlet at the side of the boat. When the boat is stationary a small pump is brought into operation which circulates just sufficient water to cool the "Sea Lion" without making it cold. This simplified system of cooling does away with a bulky pump depending upon high driving power. The "Lion" aero engine hand-starting arrangement—which is greatly in advance of marine engine hand-starting gear—is retained, and there is dual ignition. An interesting alteration is the extension of the crankshaft forward to the reverse gear, which lies in compact form close beside the main crankcase in spite of a self-starter ring and flywheel having been added to the crankshaft. The self-starter is specially geared and has a Bendix drive, features which keep down the size and weight of the electric motor.

Another interesting point is the linking up of the two magnetos and three carburettors to one lever, with the result that the ignition is advanced as the carburettor throttles are opened. Nearly full advance is obtained when the throttles are just over quarter open.

Other dimensions of the "Power Sea Lion" are as follows:—The height from shaft centre to under side of reverse gearcase is 3½ in., which is an extraordinarily low clearance for an engine of this h.p. Forward from the shaft centre line to under side of crankcase is 1 ft. 1½ in. The weight is 1,295 lb.



A three-quarter view of the "Sea Lion" which gives a good idea of how accessible are the carburettors and other vital parts of the engine.

THE INDUSTRY

AERODROME LIGHTING EQUIPMENT

THE different systems of illumination which form part of a fully-equipped aerodrome have received the expert consideration of that mammoth electrical organisation known all over the world as the General Electric Co., Ltd. Neon beacons, landing floodlights, hangar floodlights, illuminated wind-direction indicators, boundary lights, obstruction lights, etc., are some of their present products. The Neon beacon installed at Croydon Airport is a typical manufacture of the G.E.C.'s associate company, Claude-General Neon Lights, Ltd., and, while most of our readers will be familiar with a description of this particular beacon, there will be others to whom the general details will not be amiss in these particular columns.

The beacon consists of a steel framework tower of square section tapering from bottom to top, with four straight Neon tubes, 20 ft. long, mounted on each side. These tubes are held in position by means of circular steel clips lined with sponge rubber and opening on a hinge to facilitate the removal and replacement of the tubes. The tubes are 30 mm. in diameter and filled with pure Neon, burning with the characteristic Neon Red which is rich in wavelengths between 5,700 and 6,500 A., and is one of the best forms of light known for seeing at a distance when visibility is bad.

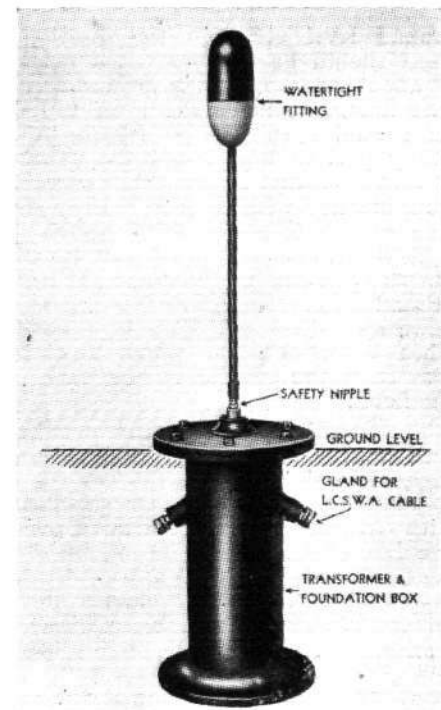
As the lower ends of the tubes are approximately 20 ft. above the ground the beacon can be seen for a considerable distance even from the ground, as well, of course, from great distances in the air. The tubes run at a current in the neighbourhood of 300 m.a. and give a light of from 15 to 20 candles per foot run. They

are operated by three 2.25-k.v.a. transformers which have adjustable chokes connected in series with their primary windings. A flasher is incorporated in the L.T. circuit and the beacon is usually operated on a flashing code sequence, but can be used for signalling Morse when required. Finally, the beacon is controlled by a push-button contactor from the control tower.

Boundary Lights

The G.E.C. have manufactured a complete installation of boundary lights for Croydon, working on their constant series potential system. It becomes possible to adopt this series because the number of lights marking an aerodrome boundary is a fixed number and rarely subject to variation during operation, so that the current and voltage in the boundary-light circuit are also fixed. This G.E.C. system gives the advantage of the constant current system without the necessity of providing a complicated moving coil transformer.

Each boundary light is fed by its own isolating transformer, and the primary windings of these transformers are connected in series in a ring main. This ring is supplied with energy by a static transformer arranged so that a current of 6.6 amps. is passed through the ring. The lamps used are Osram 600 lumen 6.6 amp. constant current lamps with G.E.S. caps. As the voltage to earth in the wiring above ground level does not exceed 6.6 volts this system of lights is very safe, for if a lamp is knocked over by an aeroplane the risk of fire is reduced to a minimum. Further, the equipment is very robust and does not include such features as film cut-



A G.E.C. Aerodrome Boundary Light.

outs, whose failure to operate might result in all lights being out at a critical time.

Wind Indicators

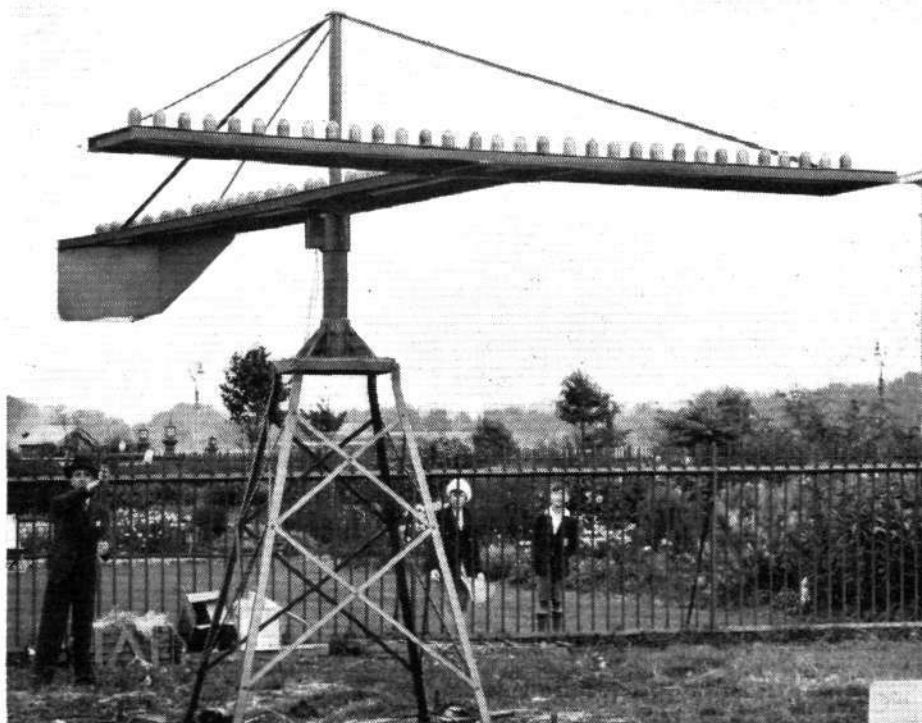
The G.E.C. installed one of their illuminated wind indicators at Lympe a short time ago. These indicators function day and night in informing pilots of incoming or departing aircraft the direction of the wind above three miles per hour, the direction being true to within 3 deg. In construction, each consists of a "T," 20 ft. long by 15 ft., the stroke being 2 ft. wide, and the whole being fixed to a substantial vertical pillar running on ball and roller thrust bearings of ample size to ensure free rotation. Stays are fitted to take the weight of the extremities of the "T." The latter is constructed of light angle section with sheet-metal top surface, finished with best quality cellulose enamel. There is a directing fin of "Y" formation, so that the indicator shall operate with a slight deviation of wind direction.

A lattice tower 5 ft. 6 in. high forms the mounting for the "T," and the whole equipment should be fixed at a point away from buildings likely to cause eddy currents of air. To prevent the "T" from undue oscillation an adjustable damper is provided.

The lighting installation on the surface of the "T" consists of lamps of 15 watt standard B.C. 100/110 (or preferably 200/220 volts) and coloured weatherproof well glasses fixed in suitable aluminium alloy cast galleries at 6 in. centres, wired alternately in two circuits, say red and green. These being fed by three sliprings enables the "T" to be illuminated in green to give permission for an incoming aircraft to land, or in red to inform the pilot that he must not descend.

Hangar Floodlights

A number of hangar floodlights have also been installed at Croydon by the G.E.C. Each unit is rotatable from



A G.E.C. Wind Indicator at Croydon.

ground level although the floodlight itself should be mounted at a height of about 20 ft. from the ground level. The floodlight is mounted on top of its rotatable spindle by means of a heavy pattern hinge, and the spindle in turn is carried by a substantial cast-iron bracket with a wide wall plate. The spindle is actuated by means of a sash-cord operated worm gear for the purpose of swinging the floodlight from ground level. To incline the unit in a downward direction there is a hand-wheel operated screw which links an arm from the spindle to the back of the flood.

The floodlight itself is constructed of lead-coated sheet steel and is pentagonal in shape, while the lamp is a standard 1,000-watt Osram gas-filled, with G.E.S. cap, having a rated average life of 1,000 hr. There are five bent reflector facets and a central pentagon all of hammered glass silvered mirror, giving an even beam of wide distribution. A 10-in. dia. light-diffusing glass dish is fixed centrally in front of the lamp to cut down the glare from the naked filament, this diffuser being readily detachable for lamp renewal or cleaning. A porcelain G.E.S. holder has a universal movement to compensate for slight errors in lamp capping and filament height.

Landing Floodlights

The aerodrome landing floodlight produced by the G.E.C. is, it is claimed, based on new principles. It is constructed in three tiers mounted on a steel framework, each containing three 1,000-watt tubular Osram lamps with line filaments. The lamps are placed horizontally and have their filaments at the line foci of reflectors. As the floodlight is split up into three sections it may be connected to an ordinary 3-phase supply, and forms a balanced load of 3 kw. per phase, thus effecting a large saving in cable and switchgear costs. The employment of nine lamps and reflectors means safety in operation, for should a lamp fail the light is only cut down by one-ninth. The use of nine small lamps rather than one large one has the further advantage that the floodlight may be switched at full power straight on to the line without the necessity of resistances or other current-limiting devices. The floodlight is mounted on a cast roller turntable fitted with clamps for locking in any position, and as regards performance it produces a wide horizontal spread of light through about 170 deg., the maximum beam candles being approximately 640,000, while the vertical divergence of the beam is very small. With really good illumination the area on which landings may be made is about 3,150,000 sq. ft. The floodlight, which is 9 kw., may be mounted on a simple trailer or power-driven chassis and moved according to the wind direction to any one of the plug points installed round the aerodrome, the points being fed from mains by underground cables.

All inquiries relating to the aerodrome lighting equipment described above should be sent to the General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2 (Temple Bar 8000).



Members of the Chartered Surveyors Institution at the Armstrong-Whitworth Aircraft Factory at Coventry. The aircraft in the hangar is the new AW.XV "Atalanta" built for the Imperial Airways' African route.

DUNLOP TYRES

LOW-pressure tyres are now in common use for British aircraft. The most recent publication from the Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham, is of particular interest to aircraft users, as it gives very complete instructions for the fitting and care not only of Dunlop wheels but also of the low-pressure (intermediate) aeroplane tyres. A table of inflation pressures assists in greater maintenance and there is no doubt that every user will benefit by this useful booklet. All aircraft users should therefore apply to the Dunlop Co. for a copy, mentioning FLIGHT when they do so.

A SILVERTOWN APPOINTMENT

MR. J. RUSSELL KNOWLES, who has for many years been a member of the Board of Silvertown Lubricants, Ltd., of Minoco Wharf, London, E.16, and who has during that time been responsible for the development of the company's business with the Admiralty, Air Force, and other Government Departments, has now been appointed Managing Director of the Company. We feel sure that our readers will join with us in congratulating Mr. Knowles on his appointment.

GOODYEAR'S PRESIDENT HONOURED

MR. P. W. LITCHFIELD, President of the Goodyear Tire & Rubber Co. and the Goodyear Tyre & Rubber Co. (Great Britain), Ltd., whose factory is at Wolverhampton, has been awarded the Spirit of St. Louis medal of the American Society of Mechanical Engineers at the sixth annual meeting of the Society in Boston. Mr. Litchfield has received this medal in recognition of "meritorious service in the advancement of airship construction and design in America." During the war his company produced many hundreds of kite balloons and nearly a hundred non-rigid airships. Since 1924 the company has built the *Los Angeles*, *Akron*, *R.S.1*, and is building the *Macon*, rigid airships. Mr. Litchfield became President of the Company in 1926.

"GIEVES" NEW FLYING HELMET

THE physical comfort of airmen receives its proper consideration in

these days, evidence of which is contained in the constant devising of new flying gear. The tailor, for instance, has taken an expert hand in shaping helmets, with good results. A new helmet is announced by Gieves, Ltd., of 21, Old Bond Street, W.1. Coupled with perfect shaping is the introduction of the Mallock Armstrong ventilated ear protector. This unit consists of a disc with a small circle of fine gauze in the centre, fixed in the rubber sponge that covers the ear. As the whole is contained in a square canvas pocket it is easily detachable from the helmet, which makes it readily adaptable for other purposes than that of flying.

The effect of the ventilated portion of this unit is to filter the noises that attempt to penetrate, permitting the human voice to pass almost exclusively. As soon as the helmet is put on and fastened one is aware of an undisturbed, muffled silence round the ear, through which the human voice penetrates without a trace of interference. Another excellent effect of this protector is that it prevents the ear from being overheated.

Of course, it does not interfere with the wearing of telephones, which are fitted over the protecting unit in the usual way. Being a separable unit the Mallock Armstrong ear protector can be fitted to skeleton head straps for men engaged on noisy work like drilling roads, and pursuits like motor racing and range shooting.

MOTOR REPAIR MANUAL

A CONSIDERABLE amount of revision and a large number of additions have been embodied in the sixth edition of "The Motor Repair Manual" just published at 2s. 6d. net by Temple Press, Ltd. Most of our readers will be familiar with the Temple Press series of handbooks for the motorist. The Repair Manual is intended for the owner-driver and amateur motor mechanic, and it now covers hydraulic brakes and fuel pumps, and gives a section on cellulose spray painting that will interest car owners. Cellulose is a medium that the amateur can apply successfully after very little practice by means of spraying, for which there are several small hand-operated spray plants on the market.

Very clear instructions on tool-making, tempering, case-hardening, lathe work, etc., are contained in this volume.

THE ROYAL AIR FORCE

London Gazette, June 21, 1932

General Duties Branch

The follg. are granted permanent commissions in ranks stated (June 22) :—
Flt. Lt. C. H. Appleton, F/O. G. F. Macpherson. The follg. Pilot Officers on probation are confirmed in rank (May 29) :—A. V. Bax, A.F.M., R. Cleland, A. J. Pegg, F. L. White.

Flt. Lt. (now Sqd. Ldr.) J. Cottle, M.B.E., D.F.C., is seconded for service with Egyptian Army Air Force (May 21); the short service commn. of P/O. on probation P. K. Laing is terminated on cessation of duty (June 21); F/O. R. W. H. Rayneau is dismissed the Service by sentence of General Court-martial (June 10).

Stores Branch

The follg. Flt. Lts. are placed on retired list :—R. G. Sims (June 17); W. B. Frederick (June 20).

Accountant Branch

The follg. Pilot Officers on probation are confirmed in rank and promoted to rank of Flying Officer (June 1) :—E. Bowman, F. C. Hayward, L. Hornbrook, T. E. Horsfield, W. M. Lyons, C. G. Stowell.

Medical Branch

Flt. Lt. V. S. Ewing, M.B., Ch.B., D.P.H., is promoted to rank of Sqd. Ldr. (June 21).

Memorandum

Gazette May 20, 1919, concerning Lt. O. Darlington is cancelled.

ROYAL AIR FORCE RESERVE

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

F/O. C. H. A. Colman is promoted to rank of Flt. Lt. (Aug. 19, 1931); F/O. J. A. Craig, D.F.C., is transferred from Class A to Class C (May 15); F/O. J. G. Parkin relinquishes his commn. on account of ill-health (June 22); F/O. G. H. Keat relinquishes his commn. on completion of service (June 17); F/O. J. W. Richards relinquishes his commn. on completion of service and is permitted to retain his rank (June 19); Gazette Jan. 1 concerning F/O. E. N. Fenton is cancelled.

Medical Branch

Flt. Lt. (Hon. Sqdn. Ldr.) T. M. Walker, M.R.C.S., L.R.C.P., is transferred from Class D2 to Class D1 (Oct. 25, 1930).

AUXILIARY AIR FORCE

General Duties Branch

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—F/O. J. P. Huins is promoted to the rank of Flt. Lt. (May 1).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Squadron Leaders : P. E. Gwyer, M.B.E., to H.Q., Wessex Bombing Area, Andover, 13.6.32, for Engineer Staff duties vice Flt. Lt. F. C. Rowland. A. P. Ritchie, A.F.C. to Air Ministry (D.O.I.), 18.6.32, for Air Staff duties vice Flt. Lt. D. L. Blackford.

Flight Lieutenants : N. Carter to No. 56 (F) Sqdn., North Weald, 14.6.32. F. Porter to Home Aircraft Depot, Henlow, 15.6.32. G. Lacey to School of Tech. Training (Men), Manston, 10.6.32. A. H. Flower to School of Tech. Training (Men), Manston, 17.6.32. F. Boston to School of Naval Cooperation, Lee-on-the-Solent, 16.6.32.

Flying Officers : D. W. Morrish to No. 26 (A.C.) Sqdn., Catterick, 14.6.32. J. Mutch to Home Aircraft Depot, Henlow, 6.6.32. J. G. Rutherford to Home Aircraft Depot, Henlow, 24.7.32. W. Anderson to No. 204 (F.B.) Sqdn., Mount Batten, 1.5.32.

Stores Branch

Flight Lieutenants : H. E. Young to R.A.F. Depot, Middle East, Aboukir, 26.5.32. C. B. Horsfield to Station H.Q., Hendon, 13.6.32.

Flying Officers : M. H. Jenks to No. 207 (B) Sqdn., Bircham Newton, 20.6.32. L. H. Anness, A.F.C. to Station H.Q., North Weald, 10.6.32.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty :—
Lieuts. (F.O., R.A.F.).—A. F. Hall to *Glorious*, for 462 Flight (June 1). G. B. Kingdon to *Courageous* (June 27).

PROMOTION

Sub-Lieuts.—R. J. COOPER (F.O., R.A.F.), to rank of Lieut. (seny. June 16).

ROYAL AIR FORCE

Flying Offrs.—M. F. Summers, to *Glorious*, for 408 (F.F.) Flight; D. A. Cameron and R. T. Cazalet, to *Glorious*, for 461 Flight (June 11). P. G. Thomson, to R.A.F. Depot (May 28).

The Fighting in Iraq

THE Sheikh of Barzan, who has been in rebellion against the Iraq Government, fled across the frontier into Turkish territory, and was arrested by Turkish troops. The Royal Air Force had been co-operating with the Iraq levies in the fighting against this sheikh, and had suffered some casualties.

Southampton and (Woolston) Airport Removal from List

AIR MINISTRY Notice to Airmen, Series A, No. 37, of 1932, gives notice that the Southampton (Woolston) Airport has been removed from the list of Customs Aerodromes of Great Britain and Northern Ireland.

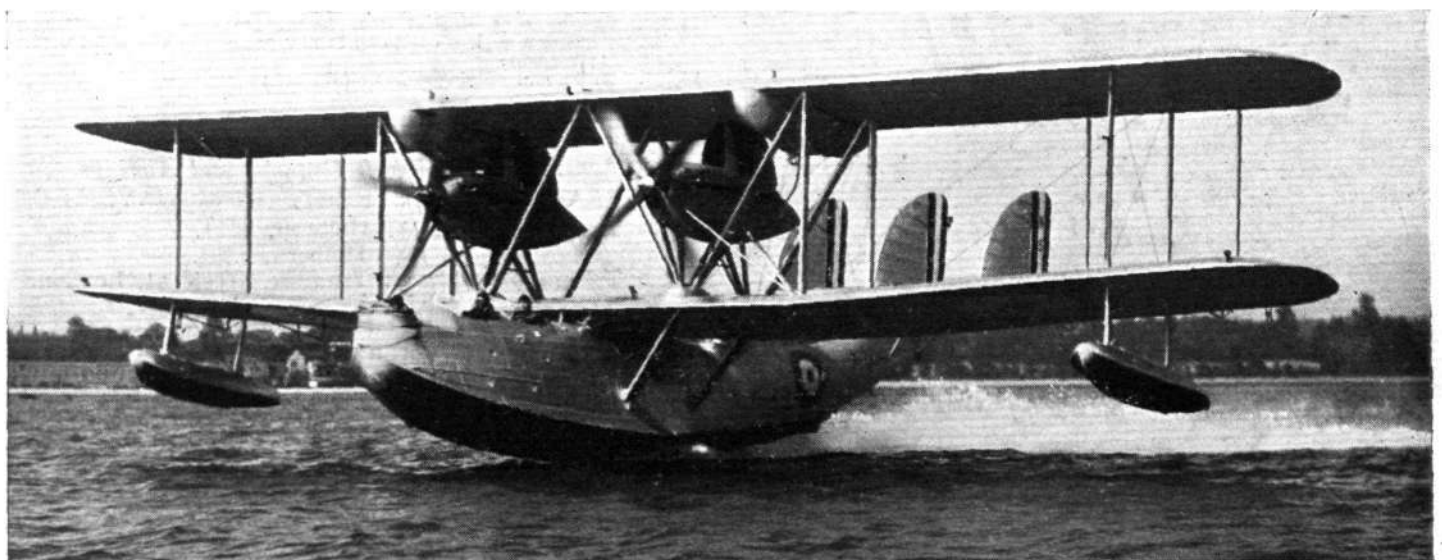
Air Navigation Convention, Paris, October 13, 1919

AIR MINISTRY Notice to Airmen, Series A, No. 38, of 1932, is a notification that a limited number of copies of the October, 1931, edition of the Convention relating to

the regulation of aerial navigation (Paris, October 13, 1919) issued by the International Commission for air navigation are available for sale at 4s. 6d. per copy. Applications should be made to the Secretary, Air Ministry (C.A.2), Adastral House, Kingsway, London, W.C.2, or Room 30, Gwydyr House, Whitehall, London, S.W.1.

High-Tension Cables over the River Severn

AIR MINISTRY Notice to Airmen, Series A, No. 31, of 1932, warns pilots that towers carrying high-tension cables have been erected one on each bank of the River Severn one mile south of Arlingham and one on each bank one mile east north-east of Arlingham. The former are 240 ft. and 280 ft. high and the latter 172 ft. high. Masts have also been erected one each on the north and south banks of Lydney Harbour one mile south south-east of Lydney. These are 190 ft. high.



STEAM COOLING : A Supermarine "Southampton" (two Rolls-Royce "Kestrel") has been fitted experimentally with steam cooling, which accounts for the small size of the radiators.

THE "LOST OASIS"

A SHORT while back we referred to an expedition, led by Sir Robert Clayton East, to the Libyan Desert with the object of locating the lost oasis of Zarzura. We have received from Shell Mex & B.P., Ltd., a few details regarding the part played by the aeroplane used in this venture, which we think may be of interest.

It having been decided to start the expedition at Kharga, supplies of food, fuel and oil were laid down there, whence they could be transported by car and lorry to the various points in the desert. Besides natives, the party consisted of Sir Clayton East, Count Almasy, Mr. P. A. Clayton, of the Egyptian Government Desert Survey, and Sqd. Ldr. Penderel, R.A.F. The latter flew from Cairo to Kharga in a R.A.F. machine on April 12, Sir Robert and Count Almasy following in the "Moth."

They found no hitch in the organisation, either for food supplies or for Shell products, and everything was found in readiness at Kharga. On April 13 the party set out in cars and lorry with supplies with the object of going ahead in the desert to mark out suitable landing grounds and lay petrol dumps.

Landing grounds were marked out with a circle in the sand made by a car, corner marks consisting of empty Shell petrol tins, and the direction of the wind was given by a line of four empty Shell petrol tins and natives standing at an interval of about 40 yd. The benzine tins were also very useful for carrying water from the Owenat Well, and also, to attract the attention of the aircraft from the ground, and an empty tin, flattened out, was very useful as a heliograph!

The landing grounds having been marked out, the party returned to Kharga for more petrol and to take the "Moth" over the route thus prepared. It was arranged that the aeroplane should alight on each landing ground after about every hour's flight, whether the cars were there or not, so as to allow them to know it had passed.

Over unknown country the machine had to follow the car tracks in the sand, and this was very difficult indeed owing to sand-blink, so when the tracks were lost the machine had to land and taxi until they were found again—a nasty business, especially as in rocky country landing markings are very difficult to find. On one occasion the aeroplane had to circle round the car because the track was invisible from the air and so the car had to be used as a moving landmark.

The procedure in case of a forced landing was that Verey lights would be sent out from the machine at

8 o'clock, five minutes past 8, 11 o'clock and five minutes past 11. Only one forced landing occurred, however, and that beyond Bir Messach when the pilots were discovered within half an hour by the cars.

Although they were able to fly over what was considered to be the lost oasis, they were forced to return to Kharga three days later, as the expedition had been timed to turn back on this day and no further supplies had been provided.

Shell fuel and oil gave every satisfaction, and throughout the whole of the expedition only three Shell benzine tins were found to have leaked at all—and as the tins in question were left in the sun for several days when the shade temperature was about 100 deg. F., the high pressure developed therein naturally caused leakage, which under the circumstances was very small.

The machine did 30 hours' flying without the oil being changed, and, although discoloured, this was in perfect condition; the oil pressure never dropped below 40 and the engine never overheated, while the plugs were never even looked at.

PUBLICATIONS RECEIVED

Stationery Trade Review. Vol. 1. No. 2. June, 1932. British & Export Publications, Ltd., 4, Carmelite Street, London, E.C.4. Price 1s.
Cylinder Bore Wear. By Birmid. The Birmingham Aluminium Casting (1903), Co., Ltd. Smethwick Birmingham.
Airplane Pilot's Manual. By Ross Mahachek. New York and London: G. P. Putnam's Sons, 21s. net.

NEW COMPANIES REGISTERED

SILVER STAR LIMITED, Rosemont, Molyneux Road, Weybridge. Capital £100 in £1 shares. Objects, to establish, conduct, and carry on the business of pleasure flights and joy- or taxi-rides by aeroplanes in Great Britain and abroad. Directors: F. W. J. Horder, Rosemont, Molyneux Road, Weybridge, company director; Mrs. A. C. Randall-Stevens, Julian Hill, Weybridge.

AIR PAGEANTS LIMITED. Capital £100 in £1 shares. Objects, to promote and encourage aerial navigation; to organise and hold aeroplane and other aircraft shows, exhibitions, and competitions, etc. Secretary: F. M. Macgregor. Directors not named.

PERCY LANE LIMITED, Planet Works, Tyburn Road, Erdington, Birmingham. Capital £3,000 in £1 shares. Manufacturers, patentees, etc. of windscreens, reflectors, motor visors and accessories for aeroplanes and motor vehicles, etc. Permanent director: P. Lane, Brueton Avenue Solihull, Warwickshire, foundry owner.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.).

APPLIED FOR IN 1930

Published June 30, 1932

- 36,190. VICKERS-ARMSTRONGS, LTD., and J. P. WATSON. Apparatus for anti-aircraft guns. (374,058.)
- 36,194. VICKERS-ARMSTRONGS, LTD., and J. P. WATSON. Apparatus for anti-aircraft guns. (374,059.)

APPLIED FOR IN 1931

Published June 30, 1932.

- 7,527. L. MARTIN. Wheels and brakes. (374,169.)
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